Industrial Finishing

Reg. U. S. Pat. Off.

An Independent Publication Devoted to the Finishing of Industrial Products

Vol. V, No. 8 | JUNE, 1929 | $1.00 a Year

Contents of this Issue

From the Editor's Window 5

Feature Articles—

The Drying Process of Finishing Materials, by F. S. Araki 23
Airplane Dopes and Their Application, by Geo. A. Endom 25
Designs and Finishes at Furniture Show, by James A. Williamson. 30
Finishing and Decorating Amusement Park Devices, by Joseph F. Schmoegner 36
Spray Guns, Hose; Material Containers, by Madison V. Leach 44
Clear Mixing Lacquers, by R. L. Masterson 53

"Baked Finishing" Section 63

Finishing Graham-Paige Automobile Bodies, by P. C. Bardin 64
Metal Bed Finishing, by E. Perry 78
Make the First Coat Right, by Joseph Cowan 80
Radiator Cover Finishes, by Arthur J. Owen 80

"Questions and Answers" Section 83

Finishing Adjustable Lamps, by G. B. Co. and M. V. Leach 85
Dip Finishing Iron Pipe, by P. G. Co., P. J. Marvington and Wm. S. Lyhne 91
Wood Handle Dip Racks, by W. A. C. Co., Fred Mannhardt and H. H. Smallwood 95
Lacquering on Porcelain Enameled Stoves, by F. W., M. V. Leach, F. S. Araki and E. W. McMullen 103

Short Articles—

Color Harmony, by J. K. Cooper 56
Finishing Artificial Pearls, by J. W. Platt 56
Finishing End Grain, by M. V. L. 61
Finishing Drawer Interiors, by H. E. D. 61
Care of Spray Gun, by M. V. Leach 81
Fixtures to Suit Room Colors, by A. J. Owen 82

"Classified Advertising" Section 114

Advertisers' Index 115

Copyright 1929

Published by PRACTICAL PUBLICATIONS, INC., 802 Wulsin Bldg., Indianapolis, Ind.

Eastern Representative
C. A. Larson
254 West 31st St.
New York
Phone, Penna. 9049

Western Representative
H. L. Watrous
550 Wrigley Bldg.
Chicago
Phone, Superior 2429

Missouri Representative
G. H. Dirhold
505 Star Bldg.
St. Louis
Phone, Chestnut 1965

DURABLE

EFFICIENT

STARTLING

In Its
Cost Reduction
Easy Working
And
Rapid Handling

RODINLAK

Is Made in all Standard Colors
For Spraying and Dipping

EXCELLENT

For Novelty Furniture, Toys, Etc.
Send for Five Gallons at Drum Price

Denny, Hilborn & Rosenbach, Inc.

BRANCHES
CHICAGO
NEW YORK
PHILADELPHIA

Kindly mention INDUSTRIAL FINISHING when writing advertisers

From The Editor's Window

WHAT'S NEW in manufacturing and merchandising the product? Something pertaining to each of these major activities has just come to our attention.

The feature that is new in manufacturing is still developing, but when perfected it will remove the last set of slow laborious hand operations in the finishing of automobile bodies—and eventually other products that are finished on a production basis.

Sandpapering and smoothing primer coats, and rubbing and polishing the final coat over all the surface—these operations are to be performed by machines in a mammoth automobile body manufacturing organization. The corporation's engineers are working out this problem, as they also have worked out mechanical apparatus for performing all of the striping work with greater precision, speed and economy.

The feature that is new in merchandising is new in the furniture industry—the opening of a big furniture show to the public. Heretofore, only accredited dealers were admitted to manufacturers' exhibitions of new products.

INDUSTRIAL FINISHING'S correspondent reports that the first public style show of the Jamestown (N. Y.) Retail Furniture Dealers' Association was held May 17 and 18 in the market building of the association. Ten thousand pieces of furniture of the very latest design were distributed throughout the nine floors of the building, composing an exhibit of the products of ingenious craftsmanship in furniture of every size, shape, type and model.

Admittance of the public to furniture expositions has long been taboo in every furniture center in the country, and much debate has attended efforts of far-sighted manufacturers and retail dealers to overcome trade opposition to public display. How far-reaching the effect will be, now that the dealers of Jamestown have departed from tradition, remains to be seen.

Howard D. Wellman, a member of the association, declares "there has been a thorough-going renaissance in furniture design. Now our furniture possesses not only its inherent high quality, but a certain beauty of line and craftsmanship as well. To one who has not been constantly associated with the furniture industry during this period of change, the new styles are no less than amazing."

This innovation of inviting the public to furniture expositions will assist wonderfully in stimulating public interest in furniture and when the general public learns half as much about furniture as it now knows—or thinks it knows—about automobiles, radios, electric refrigerators and electrical household appliances, more of the better quality furniture will be in demand.

W. H. Rohr

Managing Editor

ON ALL 4 COUNTS

There are four important fundamental things every good Lacquer Solvent should possess:

1—A degree of purity even above that of the standard lower boiling solvents.

2—Proper rate of evaporation to deposit a good film and still not cause delayed drying.

3—Good solvent power.

4—Good blush resistance.

Some solvents have one or two or more of these ideal properties, but you are always sure of finding *all four* of them in

PENT-ACETATE

The SHARPLES SOLVENTS *Corp.*

2304 Westmoreland St. Philadelphia — 548 B Railway Exchange Bldg. Chicago — 501 A Fifth Ave. New York

THE DRYING PROCESS OF FINISHING MATERIALS

Expert Finisher in charge of Lacquer Dept. at Mikami Studio, New York City, offers suggestions, comments and recommendations based on his experience with the drying of various finishing materials

By F. S. Araki

FOR ORDINARY people the drying of the finish on a surface means simply drying, and one need not bother any further; but to us finishers it has a much deeper concern. For instance, the time required for finishing, the amount of labor involved, the strength of the film obtained, the beauty and brilliancy of colors, the durability of finished articles—all depend on the action of drying, regardless of what finishing material is used. Therefore it may not be amiss to occupy ourselves for a moment on this phase of our industry.

The drying of a film of finish is said to be affected in the three different ways:

1—Evaporation or volatilization.
2—Oxidation.
3—Polymerization.

These actions however, are not fully understood as yet, and in reality they may be very much complicated affairs. It is possible that two or even three actions may take place simultaneously, and at other times gradually. We know the same material acts differently under varied conditions.

The thin film of glue, paste or shellac varnish dries by evaporation or volatilization only. Having no chemical decomposition of any sort taken place, the molecules of the substance remain exactly the same as before and they can be softened over and over again by using the same solvent employed in the original preparation of the material.

Pyroxylin lacquer dries like shellac varnish in the main, but the oxidation might accompany or follow the evaporation to more or less degree according to the lacquer components, especially the resins which dry by oxidation and plasticisers which dry by evaporation.

Tung oil and Japanese urushi lacquer are known to be dried by polymerization—that is a partial chemical decomposition takes place and the molecular weight is changed while drying, followed by the oxidation which may be completed at once or last a long period according to circumstances.

Oxidation

Linseed oil and varnish on the other hand dry chiefly by oxidation, preceded by volatilization or evaporation. Oil or varnish is changed by the action of oxygen in the air upon exposure into an elastic substance called linoxyn, which is no longer greasy or sticky. The substance is not soluble in oil, turpentine or other oil solvents, since the chemical decomposition has taken place and its molecular construction has been changed.

The oxidation is rather slow and

gradual in the beginning, but after a certain time it seems to work suddenly and a thin film of varnish or oil is changed into a sort of gelatin and the oxidation continues until this gelatin becomes no longer tacky.

Up till this stage, oil or varnish remains as a colloidal solution and if there is any contraction on the surface it does not show any notable change. However when the semi-solid gelatin changes into a solid film quickly, a state of tension is created. Naturally the contraction will open the pores by pulling the solid film away from numerous tiny pores.

The film thus obtained does not give as good a protective film as we desire. Resins and other substances act as the filler for these pores and give much closer film. For this reason varnish is more desirable as a protective coat than the oil coating.

Driers Accelerate Drying

If driers are used to accelerate the drying action, a great deal depends on the nature of oxidizing salt used as well as quality, temperature, humidity, etc.

Too much drier may cause either too rapid drying or too slow drying, according to the case. Litharge tends to set immediately but gradually, while manganese and cobalt salts remain soft in the beginning but after some time they begin to set very suddenly and become hard—sometimes too hard.

The driers always should be used as sparingly as possible to obtain quality work. The same material dried under different temperatures produces different qualities of film, therefore we must find out first the optimum (best) conditions for drying of each new material and check it occasionally.

Cheap slow-drying varnishes when stove dried, give an acid and alkali-resisting surface which is much more satisfactory than can be obtained with a high-priced air-dried varnish.

It is my experience that an ordinary pyroxylin lacquer should be dried at 70 to 75 deg. F., and the air should not be burdened with excessive humidity.

Baked Finishes

The so-called baking japan is dried at 300 to 500 deg. F. usually, and oxidation is rapid and complete under such conditions.

The compound of oil and resins is kept fused all during the time the solvents are driven off and oxidation is taking place, resulting in a very hard smooth surface.

Generally speaking, black will give better results at brisk high temperature, while colors and white should be handled slower at a lower temperature. Inadequate oven ventilation is injurious and often the cause of a dull-looking job (no luster).

When working in colors we must endeavor to obtain as beautiful and brilliant colors as possible—and don't forget the need of a strong and tough finish either.

It must be remembered also that brilliancy of colors and lustrous appearance do not depend on smoothness alone, but on the high refractive power.

The action of the drying process is simple or complex and simultaneous or continual, and in many cases oxidation is not completed over a long period, though the surface can be considered perfectly dry according to the touch test. This subject is worth while investigating more thoroughly as we have neglected this point shamefully, in the past.

"It is with some satisfaction that my opinion regarding the eventual departure from cellulose-base fabric coatings to a synthetic or chemical-base lacquer on airplane covers is being confirmed. We all like to estimate the trend of thought and practice.

"One company now is ready to market an altogether new product for the treatment of airplane fabrics and, as this concern has had wide experience in dopes and lacquers and also is a reputable concern, I believe its product will have some success. Formal announcement to the trade will soon appear, unless some technical difficulty develops.

"In my previous article, I mentioned the probability of this event. How good or how varied the use of this product will be, I do not venture to foretell, as I have neither seen nor tested any chemical-base product to take the place of dope."—

George A. Endom

AIRPLANE DOPES AND THEIR APPLICATION

How dopes are applied to airplane fabric surfaces, how many coats of dope are used to produce a finished job, what treatment is desirable or permissible between coats and after the final coat

By Geo. A. Endom

IN ORDER to insure a smooth well-doped job, it is advisable to apply a full-flowing coat when brushing dope on a cover. Do not wipe brush against side of pail, but lift it free from fluid and apply direct to surface being coated. Do this on all brush coats except the first coat.

When applying finishing tapes with the second coat, a section embracing the space of two ribs should be coated. A convenient efficient method of doing this would be as follows: As the brush full of dope is removed from container, it is applied direct to the rib that is to be taped. The dope should be brushed just enough to spread an even flowing coat over that rib and over the area back to the rib just previously taped. The taped rib just preceding the one being worked receives a smoothing coat with the dope remaining in the brush, which brings that tape up to the same number of coats as the surrounding area.

Next, the doper lays the tape over the rib in its exact position and rubs it smooth with his fingers. He then repeats the coating in process on the next rib, finally smoothing with his dope-wet brush the rib he has just finished taping. This operation is repeated until the side has been completely coated and taped. The

wing is allowed to dry thoroughly, then turned over and the process followed on the opposite side.

Edge tapes are put on last, and two methods of applying them will be explained a little later.

Never Brush Dope Too Much

Here I wish to stress a few important points. Always remember that dope is a solvent material that dissolves the undercoat as it dries. For this reason, when applying any dope to a surface previously coated with the same material, *do not brush* the dope any more than is necessary to evenly distribute it. If brushed too much or too hard, the brush "picks up" the undercoat and results in a surface showing rough and shadowy places wherever the undercoat has been disturbed. For this reason also, never brush back over a coated area that has started to set.

If the coat was applied too heavy and shows sags or runs, it is better to correct on the next coat, rather than run the risk of disturbing the film by trying to brush it out.

Remember also that dope dries very quickly when worked under the proper atmosphere and temperature conditions. Consequently, it is necessary to work rapidly, the dope will dry before the tape is applied. This will necessitate recoating in order to fasten the tape, and is apt to result in shadows appearing on the finished work. Exercise care in smoothing the tape with the fingers, rubbing out all air bubbles and sticking down all edges thoroughly. A little neatness and care in taping and patching will greatly improve the appearance of the finished job.

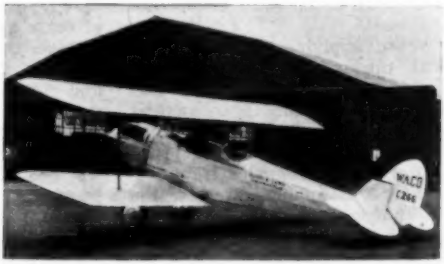
The foregoing method of taping is followed on wings, tail surfaces, and other parts that can be worked flat and turned over, but on fuselages it is necessary to tape in a different manner.

Temperature and atmosphere conditions, should be correct when applying the second coat of dope. If the room is too cold or too hot, or if the humidity is too high, trouble may be encountered. Tapes and patches may not adhere properly, which will cause air bubbles under tapes or cause edges to curl. Blushing will be seen as a discoloration and the fabric will appear unduly rough. The second coat should start to "lay the nap" of the cloth.

Taping Fuselages

The quickest and best method I have found to apply tapes (where it is impractical to apply a coat at the same time) is to dope the tape on a board.

Select a smooth board about 8 in. in width and about 10 ft. long. The tape, cut to length, is laid flat on this board and receives a heavy coat of dope. Slush the dope on the tape rather than brush it, as enough dope must be put on to thoroughly saturate the tape. Evaporation is rapid, so be sure



You too.....
Clip costs and Save!

*Farsighted Manufacturers are Wise to Clip Costs by Using Zapon Sanding Sealer No. 1038 as Prime Coat Under Lacquer or Varnish

Sanding Sealer No. 1038 pads easier—faster than shellac. For container, use a Mason jar as it reduces surface evaporation.

ZAPON Sanding Sealer No. 1038 clips large chunks off finishing costs. It costs less than good shellac and cuts sanding costs in half; dries in ⅓ the time that shellac takes. And invariably it does a better job.

Successful manufacturers who have tested and used Zapon Sanding Sealer No. 1038 have eliminated the question of its quality. Make a mental note of the following and you will soon learn why Zapon Sanding Sealer No. 1038 is the leader—it is a genuine pyroxylin lacquer, does not contain film scrap or substitutes. It is not a substitute shellac. There is absolutely no injurious ingredient used in the manufacture of this product.

Carefully check up on these claims for Zapon Sanding Sealer No. 1038.

1. Costs less than good shellac.
2. Cuts sanding costs in half.
3. Dries in ⅓ the time of shellac.
4. Fills perfectly—one coat.
5. Seals perfectly.
6. Will not bleach fillers.
7. Absolutely free from grayish cast.
8. Easier to spray than shellac.
9. The best base for lacquer.
10. The best base for varnish.
11. Water-proof.
12. No Benzol or Wood Alcohol.
13. Adheres firmly—*try to tear it off!*
14. Crystal clear.

We sincerely urge manufacturers who seek greater profits to investigate our claims—to test our product and compare results.

Zapon Sanding Sealer No. 1038 is the more profitable way to efficient production. Let us help you learn this fact. That is why we publish this advertisement to urge you to clip the coupon and send it to us.

We want to build up a business with you like we have done with other farsighted manufacturers. We believe you will want to know us better after you receive a generous sample of Zapon Sanding Sealer No. 1038.

We offer you free, a generous sample and urge you to test it thoroughly—to compare results and costs. Bear in mind that we want the big opportunity to win your confidence. We are willing to do more than our share to help you.

Clip the coupon now to ***clip*** your manufacturing costs.

You have our word not to annoy you in any way while you are testing Zapon Sanding Sealer No. 1038. We have sufficient confidence in the merit of our product and believe that you will want to buy—after testing it.

***Names of these manufacturers sent upon request**

THE ZAPON CO., Stamford, Conn.
Gentlemen: Please send free sample Sealer No. 1038 and prices. I. F. J.

Name .....

Street .....

City .....

State .....

Firm Name .....

to apply enough dope. Having thoroughly saturated the tape, it is folded zig-zag in approximately 10-in. folds, so that it will remain wet until applied.

Folded, the tape can then be conveniently picked up and carried to the place it is to be used. In applying it, hold the tape in one hand, stick the end down and smooth with the other hand. If folded properly, the tape will unfold itself as the doper moves along and as he continues to smooth it down the tape is completely finished and in position when the end is reached. This is a very convenient method of tape application and a little practice soon makes anyone of average intelligence a rapid and skillful worker.

Another method is to first brush dope where the tape is to go, then put tape in position (smoothing with the hands), then coat over the tape with a dope-wet brush.

The first method has the advantage over the latter in that only two operations are required, that is, doping the tape on a board and applying it to the surface, whereas three operations are required by the second method. The former method also has the advantage of giving the finished job a better appearance, as the last-named way of putting on tapes usually causes a shadowy stripe to appear along both edges of the tape, due to the extra dope (used to smooth the tape) showing a lap.

The foregoing methods, as outlined, can be used for applying all tapes to the parts of the airplane that cannot be coated and taped at the same time. It is necessary to apply tapes in this way, as to attempt to tape the longerons and fairings of a fuselage and apply a coat of dope simultaneously would be difficult.

The dope would dry before the taping was half finished, and if only one half or one quarter of the side were coated the surface would show a lap that would be difficult to erase. It is best, therefore, to tape the fuselage and all edges and then apply a coat of dope. Surfaces will then appear more uniform as to coating and finish.

The Building Coats

After all taping is completed and the second coat is dry, the finishing schemes start to vary with the individual requirements of different classes of dopes, the specifications of the different jobs, etc.

Up to and including the second coat of dope, the method of application is practically the same for clear acetate, clear nitrate, semi-pigmented nitrate and any other standard forms of cellulose coating. Briefly, the first coat acts as a size, and the second coat as an adhesive. The coats that follow are the building coats, and in their application many different methods and materials are employed.

The objective is to: 1—tighten the cover, 2—build the coating to fill the weave, 3—protect the fabric from harmful light rays, 4—get the finest finish possible, and last but not least, 5—to do this with the least cost without adding excess weight.

The government specification for doping army airplanes is: Four coats clear cellulose acetate dope brushed on, 12 hours aging, then spraying two coats of pigmented nitrate dope. For navy airplanes the specification was: Two coats clear cellulose acetate dope brushed on; not less than two nor more than four coats clear nitrate dope brushed on; and two coats aluminum or navy gray enamel.

(Continued on page 108)

Place your confidence in

IMPERVIOUS PRODUCTS

UNIFORMITY —

QUALITY —

PERMANENCY

Pyroxylin Lacquers
Finishing Varnishes
Baking Enamels and Japans
Protective Coatings

A Lacquer, Varnish or Japan especially made for a specific purpose for finish on Wood, Iron, Steel or Aluminum

We maintain a complete and practical baking, spraying and finishing department with trained operators for demonstrating and to assist in solving problems of baking, spraying or finishing your own products.

Your Inquiries Solicited

IMPERVIOUS VARNISH CO.

Manufacturers Industrial Finishes

General Office — 436 Seventh Ave.
Koppers Building, Pittsburgh, Penna.

Table and buffet of an Art Moderne suite exhibited.

DESIGNS AND FINISHES AT FURNITURE SHOW

Observations at the Spring Furniture Exposition in Jamestown, N. Y., reveal some interesting features in regard to the trend of designs, finishes and decorative effects

By James A. Williamson

THE ANNUAL SPRING furniture exposition of the Jamestown Furniture Market Association opened a three-weeks run on April 27th.

There seems to have been a marked change from the exhibitions of the last Spring market. At every hand could be seen evidences of a return to the old period designs—a trend away from the modernistic. The modernistic designs exhibited, were greatly modified from the designs of a year ago. This was seen in several suites of Queen Anne origin with modernistic facings. The same holds true of suites of other period designs. But in the main, manufacturers seem to be holding to the period designs more closely.

An Interesting Suite

There were, of course, some pieces brought out probably as "feelers" of the taste of the buying public. Some of these were very interesting. One suite in particular stands out perhaps above the rest. It is a dining room set consisting of the usual sideboard, china closet, table and chairs. It is termed, and rightly I believe, a real Art Moderne suite. The basic woods are walnut and mahogany. The table top is made of imported walnut with a narrow band of marquetry around the outer edge. This inlay is of ebony and satinwood. A band of the same inlay extends around the side of the table. The legs are red mahogany and tipped with metal caps in a silver finish.

A shellac *improver* that will astonish you

Plain shellac becomes a far superior material on every count—and cheaper to use

Every man who uses shellac in any way whatever will be more than interested in the astonishing shellac *improver* perfected by the Murphy Varnish Company.

Murphy Waterproof Mixing is *not* a substitute for shellac, nor a shellac of new and better quality—but a material that improves plain ordinary good shellac. Here are a few of the bare facts: Prevents shellac turning white. Increases elasticity of finish, preventing pin-holing, giving greater anchorage, and preventing shellac from scratching white. It is waterproof. The difference in flowing and spraying qualities is remarkable—you can hardly believe you are using shellac. It dries as quickly and seals as well as straight shellac and is much more durable. The appearance of the finish is a real improvement. Instead of the glaringly cheap brilliance of shellac, you have a satiny finish resembling rubbed varnish.

These are merely the facts. And the goods to back up the facts are right in the can. The rest is up to you. You know where you now use shellac and where you might use it if it were a *better* material. You yourself are the best judge of how to make the best use of this remarkable new material.

Get a small quantity of Murphy Waterproof Mixing now and learn for yourself the astonishing facts.

MURPHY VARNISH COMPANY
Newark **Chicago**
San Francisco
Essex Varnish Company, Newark
(Associate Company), *Baking Material Specialists*

Murphy *Waterproof* Mixing

MURPHY FINE FINISHES

Famous for 64 years among architects, master painters and makers of products requiring a fine finish.

Air-drying and Baking Varnishes
Enamels, Lacquers and Stains for Brushing, Spraying and Dipping

The china cabinet is walnut with mahogany legs, and rosewood facing around the outer edges. The walnut veneer in the center is diamond matched; likewise the table top. A small oblong of Carpathian elm occupies the center of the panel; and, of course, marquetry work of the sort used on the table is employed. The sideboard matches the cabinet, and the chair backs reveal the same design. The red mahogany chair legs match the table legs and are tipped with the same sort of caps that adorn the table legs. This suite aroused a great deal of comment.

As was the case last year, walnut and mahogany are the bases chiefly employed, but some manufacturers declare they are having some demand for maple, generally in the amber shades. The finishes appear to have assumed a lighter and glossier tone and walnut appears to be outstanding.

One exhibitor says he believes the public is becoming better educated along furniture lines and is more discriminating in taste. In line with this assertion it may be said that some companies are reproducing earlier period designs. Several early American or Colonial suites were noticed in the bedroom line. The two outstanding finishes are of maple and mahogany. The mahogany finishes are dull luster, but in the maple suites a blistered effect is being used; also a riffle finish. Mouldings and carvings are in general use.

Bed Room

Walnut and mahogany seem to rule as favorites, but maple is more in evidence, and rosewood to some extent. Finishes are lighter and diamond matching of

The host chair belonging to that Art Moderne dining room suite.

veneer is much in evidence. Maple in the amber shades commands a small place. Mouldings and carvings have their places and marquetry is used a great deal. One suite reveals a sunburst effect in walnut. Another appears in shell-cut zebra wood, with a modernistic touch that is attractive. Reproductions of early American and Colonial designs are noticeable.

Painted furniture appears about the same. Green and cream are combined effectively as are gold and cream and gray and cream. Floral designs show at the foot and head boards, and added ornamentation reveals the reproduction of flowers tied in bows with ends dangling—this latter evidently in carving or molded composition.

Dining Room

Outstanding designs seem to be Sheraton, Queen Anne, Hepplewhite and Duncan Phyfe. Some exhibitors are of the opinion that the Queen Anne designs hold a little advantage. Suites are of butt walnut and crotch mahogany, with a smattering of maple. In

the higher priced suites, imported walnut finds a place.

It seems that people are demanding a return to true period designs and when modernistic touches are employed they are generally in combination with a recognizable period design. Features of two or more period designs are also combined. One Hepplewhite design is of satinwood with marquetry inlay. Some sideboards contain one long drawer across the top; in others the bottom drawers are concealed by having been made part of the carved base.

In the dinette line, fewer pieces go to make up a suite. A patent arrangement allows for shortening or lengthening the table by use of two center leaves which fold over on top of each other and lie flat directly beneath the top when the table is closed. This allows for a greater length table, while at the same time conserving space. More demand for this type is seen in metropolitan districts, where apartments are small and space is limited.

Desks and Secretaries

Mahogany comes into its own in this line. The Governor Winthrop design in the secretary, with desk to match, is a pretty combination. Attention has been given to detail so that accuracy may be attained in reproduction. Automatic slides for the writing surface of the secretary to rest upon replace the old type of hinge.

Breakfast Sets

Shaded oak is extensively employed in this line. Finishes are of oil, rubbed and waxed. There are also lacquered sets with crackle and stipple effects. Any number of color combinations are available but those on display seem to be of darker tones in the oil finishes, while the lacquered sets are lighter and with a wide range of colors.

Wicker Furniture

Stick reed, stick fiber and machine-woven fiber furniture is displayed with a wide range of color combinations. Some have been dyed in the pulp and finished with a clear varnish. Enamel and lacquer finishes also have a place in this line. Modernistic trends are in evidence here. Table and floor lamps of reed and fiber are available to match the suites. High-back suites with deep upholstery for inside use are featured, while sun parlor and porch furniture is of lighter construction and mostly machine woven.

Novelty Furniture

Magazine racks, telephone stands and smokers are of walnut, mahogany and maple, plainly finished. Gaily lacquered articles of this nature are not so numerous as a year ago. In this line colors seem to have lost a lot of their popularity. End tables, coffee tables, consoles, sewing cabinets, tilt-top tables and nest tables are for the most part made of mahogany, but some walnut is used, too. Consoles are shown in the full circular top for use where a full table might be needed at times, and when not used the other part of the top extends upward along the wall. One manufacturer of this line states that mahogany is the best number in this line, but walnut is being used to some extent.

The one real test of a business policy is whether or not it makes money.

How the bodies of adult-size Scooters or Dodgem cars are prepared and finished to produce that remarkably durable and highly decorative finish which is subjected to such severe exposure and service tests

By Joseph F. Schmoegner

THERE IS HARDLY a more appropriate place for gaiety in color than the selection and application of colors for amusement park devices. The colors selected must actually shriek to attract attention of pleasure seekers. Almost any imaginable color combination is accepted by the public in amusement parks, but vivid contrasting colors are in vogue.

Usually, a great deal of money is spent to finish and decorate amusement park devices, and it is only natural that the manufacturers spending this money want to create a lasting job. The proper selection of materials and care of application therefore, play important parts in finishing these devices. Most of this equipment is exposed to all kinds of weather conditions including salt air. Some devices are subject to considerable rough treatment by the patronizing public.

One particular amusement device that I have in mind is continuously mistreated through bumps and kicks, and often I wonder what finishing material will stand up under such severe treatment. It is a miniature trolley car running on a steel floor under electrically charged network—running in any desired direction the driver may choose to direct it. Usually the floor on which these cars operate is large enough to accommodate from 20 to 40 cars.

The only protection one of these miniature automobiles has is a solid rubber cushioned bumper to save the surface from the hard bumps it gets while in operation. The cars are sturdily constructed, the bodies being made of automobile sheet steel and mounted on sturdy hardwood chassis.

Before mounting a body on the chassis, the steel shell is given a

Service is most valuable when it is adapted and fitted to your conditions, meeting your requirements from your standpoint, together with the assurance of the best and at the same time the most economical, makes Glidden co-operation of particular value to you.

GLIDDEN

EVERYWHERE ON EVERYTHING

PAINTS — VARNISHES — LACQUERS — ENAMELS

The Glidden Company--National Headquarters--Cleveland

Kindly mention INDUSTRIAL FINISHING when writing advertisers

thorough sanding with emery cloth, this treatment removing every trace of rust. Next an elastic oil primer is applied, and this is given at least one week to harden. This primer coating is applied as heavy as possible, care being taken, of course, to avoid runs and sags.

In the meantime the hardwood chassis is given a coat of high-grade linseed oil primer. Primed chassis are usually left for several weeks to dry thoroughly. The reason is obvious: All working machine parts are mounted on this wooden chassis and all possibilities of shrinkage must be eliminated (or at any rate reduced to a minimum), hence the extreme precautions taken in the selection of thoroughly seasoned hardwood, and priming same with high grade linseed oil primer.

Next the body is mounted on its chassis and sanded lightly—very lightly to avoid destroying the previous coating. Then the entire assembly is given a ground coat—preferably japan color with a small amount of raw linseed oil to retain its elasticity and durability. This ground coat is usually given 24 hours to dry. The pigments used both in the priming and ground color coats are metallic oxides to insure the highest degree of protection to the steel surface. The ground coat is sanded smooth with a fine grade of garnet paper and thoroughly dusted.

The succeeding coat is made from a high-grade spar varnish and non-fading red ground in japan—about 16-oz. of red ground in japan mixed with one gallon of spar varnish, and finally the mixture is reduced to proper flowing consistency. This material is applied with the brush and every precaution is taken to insure a faultless coating. Usually this color varnish coat is given 48 hours to dry, after which it is rubbed with No. 380 waterproof abrasive paper.

After a careful cleaning the surface is recoated again with another color varnish coat made up

One of the earlier types of cars, hand decorated.

of 12-oz. of color to the gallon of varnish. A 48-hour drying period is allowed, and the surface is rubbed smooth again with the same abrasive garnet paper and water. Now the surface is ready for decoration, and usually very elaborate designs are employed to make the car look as conspicuous as possible.

Elaborate Decorations

Years ago decorations were applied by hand, and consisted of various scenes, flowers and elaborate scroll signs. But production requirements of today demand quicker methods of decorating these products, therefore in many cases decalcomanias or transfer designs replace the slow hand-decorating process. There is hardly any other business that uses decalcomania to a greater extent than the amusement-park device manufacturers, therefore their methods of applying decalcomania should be worthy of consideration.

Take for example this particular miniature car that we have

VALENTINE'S

INDUSTRIAL

solid-covering

Gloss Lacquers

They save the cost of a polishing or buffing operation. They combine beautiful lustre with unusual covering qualities.

They give a finish of remarkable durability — excellent adhesion — exceptional resistance to abrasion and wear.

Unexcelled for exterior and interior use. On wood, metal and fibre furniture; on metal stampings, washing-machines, clocks, radios, toys . . . wherever colored lacquers are used.

Remember . . . the Valentine Technical Staff is ready, on request, to aid you in solving your individual finishing problems.

— Address —

Industrial Division

Valentine & Company, 336 Fourth Avenue, New York, N. Y.

just finished painting in a vivid red: It receives six transfer pictures. There is the front design composed of a pair of wings on each side and an airplane propeller on top. This design is laid out in aluminum leaf, edged in black and high-lighted in white. The center of the design is in the form of a blue ellipse with the name "Skooter" printed in bright yellow.

The two back bottom designs represent shields with a neatly arranged scroll effect in the same color combination, namely alu-

Scooter cars elaborately decorated with decalcomania designs.

minum leaf, black, white and blue. The two back top designs picture sea monsters that conform ideally with the contour of the car body. This design combines the color of aluminum, black, and white.

All of these transfer designs are of the highest grade and they are mounted on duplex paper; the original design is executed upon a very durable tissue paper and this paper in turn is mounted on a heavy paper.

Using Decalcomanias

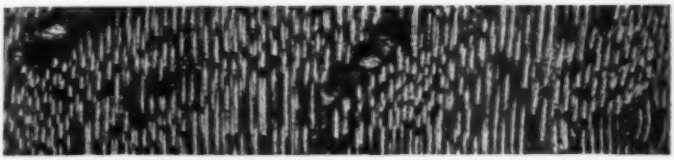
Transferring decalcomania designs upon surfaces to be decorated is a simple procedure. First of all the transfer design must be freed from the powdered talc which the manufacturer uses freely to prevent them from adhering together while in shipment or storage. This powder can be easily removed by using a clean rag or duster. The next step is to separate the paper to the extent of about one inch, or sufficiently to give a good hold to remove the upper paper after the design is applied upon the surface about to be decorated.

Our transfer design is now ready to receive the sizing varnish. Usually the decalcomania manufacturers supply varnishes for this purpose, but for the benefit of readers of this magazine who use their own materials, I will give them my favored formula of sizing varnish. Equal parts of a pale gold size japan and damar varnish make an ideal sizing varnish; this should be reduced with turpentine sufficiently to make it work easily. This sizing varnish will work out well in freezing temperature if warm water is used to wet and remove the protecting paper. The sizing varnish should be brushed on the side of the decalcomania bearing the design, and care should be taken that the sizing liquid is spread all over the design uniformly.

It takes from 20 to 30 minutes for this sizing to acquire the necessary "tack" which is required to make the transfer operation successful. The proper setting or tackiness of this sizing varnish can be easily determined by touching the tacky surface. The finger touch should lift the decalcomania readily, and it should not drop off easily.

Before applying a decalcomania decoration onto the finish to be decorated, the surface should be moistened with a damp sponge. This practice will allow the paper to acquire sufficient dampness to

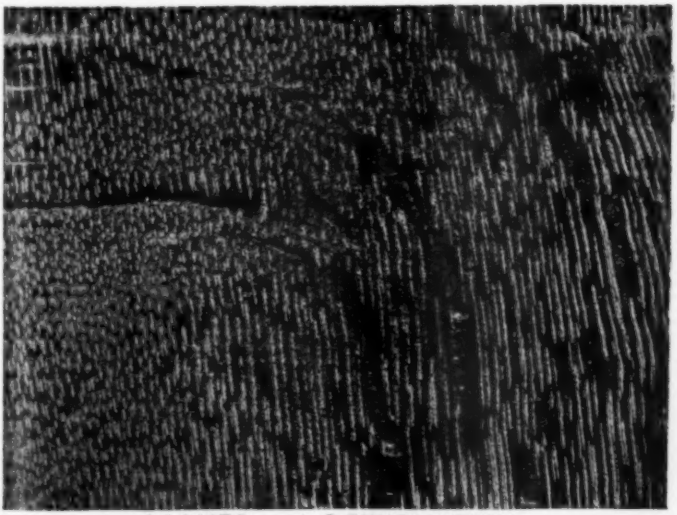
STAINING LACQUER



STAINING LACQUER is a thoroughly different finishing material which produces original color effects .... bringing out and emphasizing the natural beauty of the grain. On oak, it is particularly effective.

Beautiful.... economical.... and extremely durable.... it makes an ideal finish for any kind of wood in novelty furniture of all kinds.

Write for complete information ... and a demonstration at your convenience.



MAYER & LOEWENSTEIN

4343 Vernon Blvd. Long Island City, N. Y.

Leaders Since 1846

Kindly mention INDUSTRIAL FINISHING when writing advertisers

stretch, which makes it easier to roll out. This rolling out operation is done with a soft rubber or felt roller dampened in water, first with the heavy paper still in place. Now we remove the heavy paper entirely, starting from the corner where we had previously split the paper before applying the sizing varnish. The decalcomania in this state (with heavy paper removed) is rolled down again with sufficient pressure to smooth out every air bubble that may be under the design.

After the remaining thin paper is thoroughly saturated with water, it is gently lifted and the decoration remains on the finished surface. It is lightly sponged with a damp sponge, and the wet roller is brought in action again, being sure to roll out any remaining air bubbles. Finally the design, which is still wet, is cleaned off with a water-wet rag dipped in benzine to remove all superfluous sizing varnish; then it is sponged with clean water, and finally wiped off with a damp chamois skin. This decoration is left overnight to allow the sizing varnish to dry thoroughly.

Latest Model Cars

As some of the accompanying cuts indicate, the later models closely resemble automobiles and are finished accordingly. The bodies are painted red with a triple striping. The center line is in black 7/8-in. wide, and is edged on both sides with a fine line of cream. The louvers on the side of the hood are decalcomanias in aluminum background and edged in black. The radiator shield is finished in aluminum-leaf with a 48-hour sizing, and the leafing is done by hand. The large number on the radiator core is a decalcomania in bright yellow edged in red. The radiator emblem, in the form of a trademark is also a decalcomania in various colors.

The extreme edging or molding of the car is striped in bright yellow. The steering wheel and

One of the newest cars. Notice the characteristic automotive design.

column, also the instrument board, are finished black. The cars are upholstered with bright green velour carpet. This is a fitting example of the various color schemes that typical amusement-park devices require.

The final finishing operation consists of an application of high-grade marine spar varnish. This varnish is usually given one week to dry before shipment is made. The secret of the great wearing qualities characteristic of the finish applied on these devices lies in the ample drying periods of the in-between and final coats.

New Catalog on Mixers and Mixing Tanks

The Alsop Engineering Co. (portable electric mixers and glass-lined mixing tanks), 47 W. 63d St., New York City, has a new catalog ready for distribution which will be sent on request.

Day-Cote

the next best thing to pure shellac

WE AGREE with the American Bleached Shellac Manufacturers Association that there is no substitute for pure shellac. But if you can take a little more time for your sealing coat to dry, Day-Cote will give you a tough, durable finish at low cost. As a matter of fact, some manufacturers of novelty furniture use Day-Cote as a finish coat because it may be rubbed to a satiny lustre. Day-Cote won't turn white, and it stands up like an oil varnish finish. Day-Cote may be brushed, sprayed or dipped. Considering its quality, Day-Cote is sold at a very low price. Ask for sample of white or orange, or have our demonstrator show you how well it works in your own plant.

The Care of—

Spray Guns, Hose; Material Containers

Experienced foreman finisher explains what equipment, material and methods to use in cleaning spray guns, air hose, material hose material containers and fittings

By Madison V. Leach

IN ORDER that the spray operator may produce as much as possible of anything placed in production, an expert spray man should be detailed to find out just how a certain article should be sprayed in order to determine the least number of strokes required and the minimum amount of material needed. All unnecessary movements and material wastage should be eliminated. It is also important to find out whether a wider or narrower nozzle should be used, what air pressure is most suitable for the material used, etc. All these points should be checked up to find the most satisfactory and economical way to do the spraying.

This information, properly recorded and kept by the foreman, will be very useful when starting a new man during the busy or rush season—when extra help must be added for perhaps only a short time. The new spray man should be directed to follow these efficient and economical methods, instead of being allowed to "run wild" and work according to his own preference or habits.

Experience teaches that habits are formed by constant practice, and the foreman's job is to teach his workmen to become accustomed to doing things right, in order that they may produce the utmost with the least exertion and at the least cost to the finishing department for time and material.

Cleaning Spray Guns

An efficient spray gun is a fine tool and should be handled and cared for as such. It needs to be kept clean; points of friction must be oiled and a suitable "keeper" should be provided to permit of hanging the gun in a proper solvent overnight. The proper solvent to use is the same that is employed to cut the material used in the gun while spraying. A square 5-gal. thinner can with the top cut out,

Spray finishing the interior of a kitchen cabinet. Notice the metal shields temporarily set in openings to keep white finish within bounds.

FEATHERWEAVE

The latest art metal finish in beautiful ripple or brocade effect

The smart, modern decorative note for finishing radio cabinets, furniture, business machines, novelties, etc.

A one coat method—easy to handle—economical—sure in attractive effect. No primer needed. Bakes in ordinary oven. Fits into ordinary shop practice without special equipment.

Dries to tough, wear-proof film—giving metal a fabric or leather coating finish.

Eliminates coldness to touch usual in metal objects.

Transforms any metal piece into object of real beauty with the simplest preliminary surface preparation.

The new *Featherweave* effect is now available in four basic colors adaptable either to a one or a two coat system. We can also supply special colors to meet your particular needs.

Use our technical service. **Our service places a technical man in the shop of any customer. He will gladly help you with your finishing problems. He will develop finishes, prepare color schemes, render every assistance to make your product attractive and salable.**

Featherweave is one member of a line of handsome industrial finishes made by Sherwin-Williams. Mail in the coupon below and let us help you.

THE SHERWIN-WILLIAMS CO.

Cleveland, Ohio

Largest Paint and Varnish Makers in the World

SHERWIN-WILLIAMS

Art Metal Finishes

Trademark Reg.

The Sherwin-Williams Co.
Dept. 708, 601 Canal Road, N. W.
Cleveland, Ohio.

Please send me complete data on Sherwin-Williams Art Metal Finishes.

Name .....Business Title.....

Address .....

City .....State .....

makes a good keeper for ordinary spray guns. A lid may be provided to retard evaporation and the consequent loss of liquid that the gun is suspended in.

For cleaning nozzles of any spray gun, use an old bristle brush —never a wire brush, as this will damage the nozzles and affect the spray ever afterward.

Material Hose

The material hose should be cleaned frequently. One excellent method is to blow out the hose with compressed air and fill it with the proper solvent for the material being used; plug up the ends and put away the filled hose by hanging it so the ends are up, to prevent material from running out. When the hose is to be put into use again, it should be drained and blown out so that it will be perfectly clean.

Never coil up a material hose and put it in a bucket of naphtha. This softens the coating of rubber and shortens its period of usefulness. If the hose has been neglected and seems to be partially clogged with material, prepare a piece of No. 9 fence wire with a small chain attached to one end, the chain being considerably longer than the material hose. Run this wire through the hose and pull the chain through; then fasten one end of the chain to a post or bench and slide the hose back and forth a few times. This will scrape the inside material loose and when the hose is blown out and cleaned a few times it will be okey for use again. Extra lengths of both air and fluid hose should be kept in stock ready for immediate use.

When either hose becomes so worn inside that the cotton fabric is exposed, the hose is unfit for further use; it shouldn't be used even for spraying primers or ground coats, for aside from the liability of cotton fibers choking the gun, these cotton fibers may spray out on the surface, causing trouble and producing a marred finish.

Material Containers

Material containers of the floor or pressure type should be made throughout of materials that will withstand repeated cleaning with lye solutions without injury, for after long usage these containers become unsightly and should be cleaned. They should be made in such a manner that one can be taken apart and put in a cleaning solution and left over Sunday, then reassembled Monday morning ready for use again. Special funnels prepared to have strainer cloth easily attached, should be provided for each container, one of these to be used for each color or material.

To save time in filling material containers, I have often wished for a larger pressure relief valve, so that pressure could be more quickly released; and instead of unscrewing a plug to fill the tank, there should be a larger valve that could be opened and closed—one that would be air tight when closed. Also, in the rush season when every minute counts, two pressure containers should be hooked up to the same gun with T-joint connections, so the spray man can continue spraying by closing the valve of the empty tank and opening the valve to the full tank; then a helper can fill the empty tank without interrupting production.

When an overhead or gravity-feed container is to be idle for sometime (such as overnight) the material should be cleaned out;

"STANDARD"
Since 1870
VARNISH-LACQUER-ENAMEL
For All Industrial Requirements

StandLac System of Automobile Finishing
StandLac Lacquers equal to the best
StandLac Undercoats superior to the best

Rapidity of application — remarkable filling (one coat equal to two coats of ordinary surfacer)—easy rubbing, won't lift or raise under lacquer.

Our experts are at your service and invite your inquiries on Lacquer—Varnish—Enamel.

STANDARD VARNISH WORKS

NEW YORK 443-4TH. AVE. LINDEN, N.J.
CHICAGO 2600 FEDERAL ST.
DETROIT NEVADA AVE. & BLOOM ST.
LOS ANGELES, CALIF.
LONDON BERLIN GOTHENBURG

the hose should be disconnected and attached to the air valve on air transformer and blown out; then the hose should be reconnected to the tank, the tank filled with naphtha or cleaner, the gun end of hose connected to the air transformer, and the tank elevated so the naphtha or cleaner fills the hose. Let it stand this way until it is needed again.

If lacquer is being used, the lacquer thinner or reducer can be used for this purpose. Afterward, this same thinner can be used to thin the next batch of material and no waste occurs, whereas if cleaner was used it might have to be thrown way. However, if the container it to be idle more than a day or two, it may be best to use cleaner and discard it afterwards, for reducer may evaporate or part of it may evaporate and throw the next batch of lacquer out of balance.

Fittings; Agitators

If the faucets or material cut-off valves of these overhead containers become dry or stuck, remove the part that turns and rub a little tallow on it; also clean out the hole through which the material flows and then replace the valve. One cleaning will serve for a long time and will prevent any trouble of this nature.

For pressure containers I prefer air-propelled agitators or air-propelled paint mixers with agitator blades of wood or bronze. I would hesitate about using a mixer driven by an electric motor unless I were absolutely sure that no spark could possibly form at the motor or switch, because if there ever was a good place for a fire to start by an electric spark, it is over a paint or lacquer mixing barrel.

Southwestern Representative for Cadillac

The Cadillac Shellac Co. Inc., Detroit, announces the appointment of Mr. Harry G. Knapp of St. Louis, as its Southwestern representative. Mr. Knapp is located at 1857 Railway Exchange Bldg., St. Louis.

Loose-Leaf Catalog by Quincy Compressor Co.

The Quincy Compressor Co. (air compressors and supplies), Quincy, Ill., has published a loose-leaf folder catalog containing its bulletin sheets Nos. 100 to 110. These bulletins, printed on heavy orange coated paper, size 8½x10½ in., illustrate and give specifications of the complete Quincy line of compressors and compressor equipment.

Binks Spray Equipment Co. Acquired by Hurley and Roche

Neil C. Hurley and J. F. Roche, operating as the "Chicago Utilities Corp.," have purchased and taken over the active management of the newly reorganized Binks Mfg. Co., manufacturing a complete line of Spray Painting Equipment and Spray Cooling Systems. This company was formerly known as the Binks Spray Equipment Co.

Mr. Hurley, President of the new company, was formerly Vice-President, President and Chairman of the Board of Directors of the Hurley Machine Co., and is well known as one of the pioneers and leaders in the development of the washing machine industry in America.

Mr. J. F. Roche, who was formery Manager of the Montana Power Co., Vice-President of the Apex Electric Distributing Co. and Assistant to the President of the Edison Electric Appliance Co., is Executive Vice-President and Treasurer of the reorganized company.

The Board of Directors contains names of many business and industrial men in Chicago, including George A. Hughes, President of the Edison Electric Appliance Co.; N. L. Howard, President of the Chicago and Great Western Railroad; Neil C. Hurley; Robert Chambers; J. F. Roche; William Hoch and Paul Morrison.

The new company's stock has been listed on the Chicago Stock Exchange.

According to the management, "the introduction of a new and greatly improved spray can by the new company is causing a wide increase in the demand for Binks products throughout the painting and finishing industries."

CLEAR MIXING LACQUERS

Explaining some interesting characteristics about clear mixing lacquers, and how, where, why, and when to use them in connection with modern wood finishing operations

By R. L. Masterson

MANY FINISHERS, I believe, have noticed the tendency of a shellac coating to turn gray or white in spots, in the presence of moisture. This whitening of a shellac film occurs not only when water comes in actual contact with the finish, but often shows up during damp weather when the shellac absorbs moisture from the air. Certain shellac substitutes likewise have this same characteristic.

Mixed With Shellac

To overcome this tendency of the finish to turn white, mixing lacquers are often added to shellac or shellac substitute solutions. The nitrocellulose content of the mixing lacquer makes the shellac or substitute shellac film harder, tougher and more moisture resistant. At the same time it does not materially reduce the good filling and easy sanding properties of the shellac.

Certain types of "open pore" or "semi-open pore" finishes, such as the so-called "wax finish," are frequently produced with mixtures of shellac and lacquer. Some furniture manufacturers even build up a full-bodied, rubbed finish with mixtures of this type to give an imitation lacquer finish. Others use shellac-lacquer mixtures as undercoats, and finish off with straight lacquer.

Shellac-lacquer mixtures of this kind are probably never as tough, water resistant, or durable on the wood surfaces as are finishes produced with a true wood lacquer, and I do not recommend their use where best results are imperative. Where it is desired to use a mixing lacquer with shellac or substitute shellac, however, certain lacquer manufacturers are prepared to furnish mixing lacquers suitable for the purpose.

The most commonly used mixture of this type is one consisting of:

Mixing lacquer.....½ by volume.
Shellac (4-lb cut).....½ by volume.
Denatured alcohol ....½ by volume.

A 2 or 3-lb. cut of shellac can be used instead of the 4-lb. cut, if desired, but in this case a smaller amount of denatured alcohol should be used. Substitute shellac solutions are sometimes used to replace the shellac in this formula, but when this is done the durability of the resulting finish is usually lowered. The best type of shellac to use in this mixture is refined white shellac, which has had most of the wax removed from it. The next best shellac is ordinary white shellac; then next best is orange shellac.

How to Mix

In making a mixture of shellac and lacquer it is very important to mix the ingredients together in the proper order, or there is danger of throwing some of the ingredients out of the solution. This rule is one which should be followed closely:

Always *add the shellac to the*

lacquer (and not the lacquer to the shellac), slowly stirring all the while. Then add the denatured alcohol or other reducer while continuing to stir.

It is necessary to follow this precaution for the reason that the solids, which are most likely to be thrown out of solution, are in the lacquer and not in the shellac. By adding a small amount at a time of the shellac or substitute shellac solution to the lacquer, any small amount of solids that may be precipitated are immediately re-dissolved by the stronger solvents in the lacquer. On the other hand, if the lacquer is added to the shellac, the concentration of the solvents in the shellac is great and some of the lacquer ingredients may be permanently thrown out of solution.

This mixture of a third lacquer, a third shellac and a third denatured alcohol contains about all the denatured alcohol that can be added without danger of precipitating some of the ingredients. Larger amounts of denatured alcohol are almost certain to cause blushing in the dried film.

To avoid blushing some finishers make a practice of using a lacquer reducer to replace the denatured alcohol. The stronger solvents in the reducer hold the mixture together better than denatured alcohol and reduce the tendency to blush.

Larger proportions of lacquer than those given in the formula can be used if desired, but the resulting film will be harder to sand and will give a thinner body of finish on the work.

While regular heavy-bodied wood lacquers can be mixed with shellac to moisture-proof it, it is better to use a mixing lacquer that has been made purposely for mixing with shellac. While shellac-lacquer mixtures of this kind are perhaps better than straight shellac, they are not as tough or durable as ready-made lacquers of proper construction.

For Over 40 Years

BESECO - LACQUERS

Have Stood the Test of Time

Nitro-Cellulose Solutions of all Kinds.

Bloomfield Chemical Co.

Works — Harrison, N. J.

P. O. Box 233 — Newark, N. J.

Cooper's Combined

LACQUER

A Paint Varnish Lacquer For Brush Dip or Spray

The Three combined in One

7 - Primary Colors - 7

From which all shades may be made

Chas. Cooper & Co.

10 Mulberry St. New York, N. Y

Works: Newark, N. J.

Established 1857

France, Campbell & Darling, Inc., Moves to Own Building

France, Campbell & Darling, Inc. (importers of varnish & lacquer gums), 133 Front St., New York City, announces that, "on June 1, 1929, we will be moving our General Offices to our own building located at the corner of 2nd Ave. & 15th St., Brooklyn, N.Y. This will consolidate warehouse, factory and offices, all operating in one building, which we feel sure will be an advantage to our customers in the way of service and closer supervision at all times."

SPRUANCE QUALITY

Here are fillers that give real "foundation"

"SPRUANCE QUALITY," Paste Wood Fillers give you a basis that requires fewer finishing coats to give you perfect results.

Fillers that go deep into the pores--and stay there without shrinking and that wipe off easily, leaving the pores full, dry and hard in 24 hours. Fillers that you will bank on after you have tried them.

SPRUANCE QUALITY
PASTE WOOD FILLERS

The Gilbert Spruance Co.

Manufacturers

Wood Finishing Products

Philadelphia **Pennsylvania**

"A FINISH FOR EVERY PURPOSE"

Kindly mention INDUSTRIAL FINISHING when writing advert'sers

Color Harmony

Color is a great deal like music. One often sees an article that has been decorated with colors that do not harmonize or comply with the nature and purpose of the particular product. The effect of clashing colors on the eye is much the same as "off-key" music to the ear. I have compiled a list of color combinations which may be followed with the assurance that there will be an agreeable color harmony produced.

Yellow harmonizes with blue, crimson, violet, brown, black.

Blue, with crimson, black, white, neutral gray, salmon pink, yellow, corn color, gold, brown, orange, green.

Red—Black, orange, gold, violet, yellow, neutral gray, blue.

Orange—Scarlet, green, purple, brown, violet, blue, black, crimson.

Dark Green—Yellow, gold.

Bluish Green—Orange, gold, lemon, light green.

Normal Green—Scarlet, yellow, tan, gold, orange.

Black—Olive, blue, green, yellow, salmon pink, orange, gold, white, crimson.

White—Orange, black, blue, purple, red, green, brown.

Violet—Scarlet, yellow, tan, gold, orange.—J. K. Cooper.

Made *free* from gum

Auto Lacquers

Of Dependable, Superior Quality

We have been manufacturing for 70 years at Newark, N. J.

Chas. Cooper & Co.

19 Mulberry St. New York, N. Y.

Works: Newark, N. J. Established 1857

RAUX ESTER GUM

Rosin Ester Gum 115 C
Congo " " 135 C
Manila " " 140°C
Gums cut, fused or treated to meet individual requirements.
ROBERT RAUH, Inc.
480-490 Freilinghuysen Ave., Newark, N. J.

Finishing Artificial Pearls

Pearls and shells are not the only things of the water that are painted with the gorgeous dyes of the rainbow. Fish live in iridescent glory, but how to transfer this vivid living beauty to cold lifeless material was long an unsolved problem.

The brilliancy of coloring in a living fish often dims considerably soon after the fish is taken from the water and in some instances fades almost completely. This coloring matter exists in a layer of the scales which can be removed and used to give color and luster to other things and therein begins the story of artificial pearls of today.

Imitations that could be mistaken for the genuine are recent and it is at this very time that tney are at the zenith of their perfection. With special glass and "pearl essence" made from fish scales, the manufacture of pearls by artificial processes has been accomplished.

"Richelieu Pearls" boldly blazoned on Fifth Ave., New York City, informs all the world that Joseph H. Meyer Bros., whose manufacturing plant is in Brooklyn, manufactures artificial pearls comparable in every quality of beauty, ornamental value and appearance with those manufactured in the laboratories of the sea. Materials and processes used in the manufacture of "Richelieu Pearls" have a nearer resemblance to those

QUICK DRYING= FOR CENTURIES

First for centuries!

Shellac has been used continuously since the days of Sanskrit. It has so many advantages that no great hubbub has ever been raised about its drying speed. But Pure Shellac, the world's standard, is the original quick drying finish!

Shellac is nature's own product. The market is flooded with substitutes, many of which masquerade under "trick" names that sound like shellac. But shellac cannot be made synthetically. Insist on the real thing. Manufacturers using Pure Shellac are proud to say so.

American Bleached Shellac Manufacturers Association, 330 Seventh Avenue, New York, N. Y.

The word "Shellac" standing alone on a label may mean little. But "Pure Shellac" on an Association member's label means that his product has not been adulterated and that it measures up to the rigid standards of the American Bleached Shellac Manufacturers Association.

THERE IS NO SUBSTITUTE FOR

PURE SHELLAC

used by nature than is the case in many manufactured substitutes for other natural products. This firm has placed costly strings of pearls in its exhibits of artificial pearls and has challenged anybody to select the genuine from the artificial by means of inspection up to ordinary reading distance.

This factory not only produces perfect imitations of all types of genuine pearls, but through a careful study of pearls the laboratory is able to produce tints and types that nature has never known. The lady of fashion today may have tinted pearls, rose, green, blue, violet, tan, yellow or any color that will suit her costume or fancy, all of them with the beauty and opalescence of the most gorgeous natural pearls. Thus pearl making has become a fine art.

The most interesting process begins now when the carefully manufactured glass beads are turned into pearls—pearls as truly as those made in nature's own laboratories. Pearl essence is prepared from fish scales in parts of the laboratory where expert chemists with inborn conceptions in the artistry of colors prepare chemicals necessary to use with pearl essence, which is now made into a thoroughly durable lacquer. This is as permanent as the natural nacre* from which the layers of the genuine pearl are built.

Pearl essence or artificial nacre begins with fish living in the sea. Fish scales are purchased from fishermen, and they receive proper care and treatment at the earliest moment in order to preserve the valuable qualities of the coloring material. This firm maintains two stations for the purchase and treatment of fish scales at different points along the Atlantic Coast —one in the upper latitudes and one in the middle latitudes of North America.

The pearl essense is prepared from these scales and brought to the Brooklyn plant. Here it is turned into a heavy, milky fluid that reminds one of a metallic silver lacquer.

The beads are mounted upon mandrels—the smaller ones upon wooden mandrels, while the special types and larger beads are mounted upon steel mandrels. Each type of mounting is installed in a dipping frame that holds a dozen gross or more.

This frame is set up in a machine that contains a small tank or pan of the pearl essence lacquer. Manipulation of the machine inverts the frame and dips the mandrel mounted beads sufficiently into the heavy lacquer to just cover them. The frame is slowly raised and reversed and is then taken away to permit the embryo pearls to dry. This takes 48 hours. When the beads are thoroughly dry, the frame is returned to the machine for several more similar dippings each of slightly different tint.

In this way, layer upon layer of artificial nacre is built up over the base substance of the pearl so that in the hands of skillful experts these artificial pearls become realistic in their opalescence and gleam with the colors of the natural pearl they represent. They now go through various processes of polishing and other treatments. After being strung they are ready to challenge the eye of expert natural pearl connoisseurs.

Because they are synthetic pearls, they are often more uniform than any produced in nature's laboratories—and they can

*A shellfish that yields mother-of-pearl.

LACQUER IT WITH ZELLAC

Let others talk of lower price.
But let's agree right now—
That when it comes to quality
It's all in knowing how!

ZELLAC

The Gentle Art of "Getting By"

Most talk about bargain prices is camouflage. And camouflage is used only when a man has something to hide! The manufacturer of finishing materials who simply doesn't "know how" cannot be expected to deliver quality—the sound basis of sales and production economy.

Zeller chemists know their business through half a century of exclusive lacquer manufacturing. They supply Zellac lacquers and lacquer enamels on the policy of "Quality First," *each grade specifically formulated to meet each customer's special requirements.* Then you are quoted the lowest prices consistent with Zellac quality. Zeller customers do not worry about "getting by," as to either quality or economy. They know that with Zeller products they can deal "out in the open." A trial order made to your specific needs will provide you with conclusive evidence.

ZELLER LACQUER MFG. CO.
Incorporated
20 East 49th Street, New York City

ZELLAC
For Every Industrial Purpose

CHICAGO DENVER
LOS ANGELES SAN FRANCISCO
PORTLAND SEATTLE
WICHITA DALLAS

be made every day in any size, shape or tint. Oriental pearls are manufactured to order, Persian pearls likewise and Australian or any other kinds are produced whenever desired, true in luster and opalescence to the natural product. — Excerpts from "Reproducing Nature for Pearl Lovers," by J. W. Piatt in April issue of *Industrial Gas* Magazine, 9 E. 38th St., New York City.

Finishing End Grain

The finishing of end grain rightfully begins in the cabinet shop where exposed end wood should be made as smooth as possible. Exposed ends of chair legs, table legs, etc., can be made to hold a good finish comparable to the sides, if a few coats of good shellac are wiped into the end surfaces with a pad, using a circular motion and rubbing till dry. This will glaze the ends so that the penetration of subsequent coats will be no greater here than on the sides. The number of coats of shellac to use will be governed by the porousness or density of the wood grain.—M. V. L.

Finishing Drawer Interiors

If the new orange or lemon-colored stains or finishes are desired for drawer interiors, the wood should be of a uniform light color to take a nice finish. Where material used for drawers is largely made up of millroom scrap wood of various colors, a stain dark enough to bring the lightest up to the darkest in shade should be used. One stain and one varnish or lacquer coat are about all that are used here.

Some manufacturers use a material that has a decided cedar-

new!

Economy Deluxe Sprayer

For the user of industrial spray equipment this new *Economy DeLuxe Sprayer* gives better application of any paint, varnish or lacquer. Combines high efficiency, simple operation and puts new life in the paint shop. Light in weight, does not clog, easily cleaned. There are many good reasons for the present popularity of Economy Spray Products PRICED: *DeLuxe Spray Gun—with material tube, cover, container, 25 feet air hose and connections and agitator . . . $32.00. Above without agitator . . . $30.00. DeLuxe Gun without any of above accessories . . . $22.00. 25 feet air hose with connections . . $4.50. 1 quart metal container without cover . . . $2.50.*

ECONOMY MACHINE PRODUCTS CO.,
5214 Lawrence Avenue,
Chicago, Illinois.

Please ship me equipment listed on margin. Send complete specifications and data on other Economy Spray Equipment.

Name .....
Address .....
City .....State .....

oil odor—and which resembles cedar in appearance—for finishing drawer interiors; a good talking point for the furniture salesmen!

But why not make metal drawers with wood fronts, using aluminum or Monel metal? They would be mouse proof, swell proof and would require no finishing.—H. E. D.

New Catalog on Portable Spraying

The new catalog, "Portable Spray-Painting Equipment" of the DeVilbiss Co., Toledo, Ohio, contains inside the covers, 28 pages size 8½x10¾-in. which reveal information and illustrations covering the complete line of portable spray-painting equipment and spray-equipment accessories manufactured by DeVilbiss.

H. J. Heindell with Valentine & Co.

H. J. Heindell has joined the Aeronautical Dept., of Valentine & Co. with headquarters in New York. Mr. Heindell is an old timer in the airplane business, having been associated with the Curtiss Co., as far back as 1914. Recently he has been concentrating on airplane finishing.

Court Decision on Spraco Equipment

A letter from an advertising agency handling publicity for Spraco, Inc. states that: "In some quarters it was felt that the Spraco guns and equipment infringed on certain other manufacturers' patents and for this reason, prospective users hesitate to buy the products because of fear of prosecution.

"The decision handed down by the U. S. Circuit Court of Appeals for the Ninth Circuit has cleared up this situation and definitely upholds the Lower Court's judgment in stating that Spraco Equipment does not infringe on any other maker's patent."

The notice reads: "The U. S. Circuit Court of Appeals for the Ninth Circuit has decided that Spraco Pressure-Feed Painting Equipment, manufactured by Spraco, Inc., of Somerville, Mass. and sold by it to the Ford Motor Co. for use in its branch plant in San Francisco, Calif., is not an infringement of the U. S. Letter Patent No. 1,196,691, commonly referred to as the Hopkins' Patent."

Special Department
BAKED FINISHING

Yellows
Greens
Blues
Reds

Any Brilliant Color Finish Can Be Had As Easily as Black with

HILO

COLORED BAKING ENAMEL

Because they are handled the same as Black—same Thinners, same equipment for applying, same baking procedure, except that they bake at lower temperature.

Finish your product with perfect results in any color you want without departing from your regular finishing methods.

Write for Bulletin No. 7 — Hilo Standard Colors

Hilo Varnish Corporation

1 Gerry Street Brooklyn, N. Y.

Pittsburgh - Chicago - Philadelphia - Boston

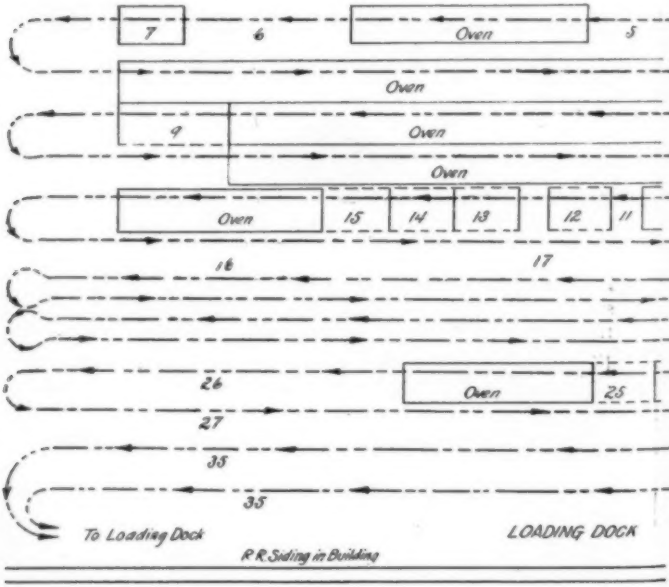
FINISHING GRAHAM-PAIGE

Industrial Finishing's editorial representative describes and illustrates the entire automobile-body cleaning and finishing system employed in the modernly-equipped body plant of the Graham-Paige Co. at Evansville, Ind.

By P. C. Bardin

THREE IMPORTANT objectives entering into the finishing of automobile bodies are durability of finish, beauty and economical production. All three objectives are dependent upon a great many men and operations, and the mechanical equipment both in the plant where the finish is applied and the factory where the finishing materials are manufactured.

In lacquer finishes too much stress cannot be placed upon preparing the metal surface for the primer. It has been found that the less surfacer and putty used on the surface in the undercoating, the more durable the final finish will be.

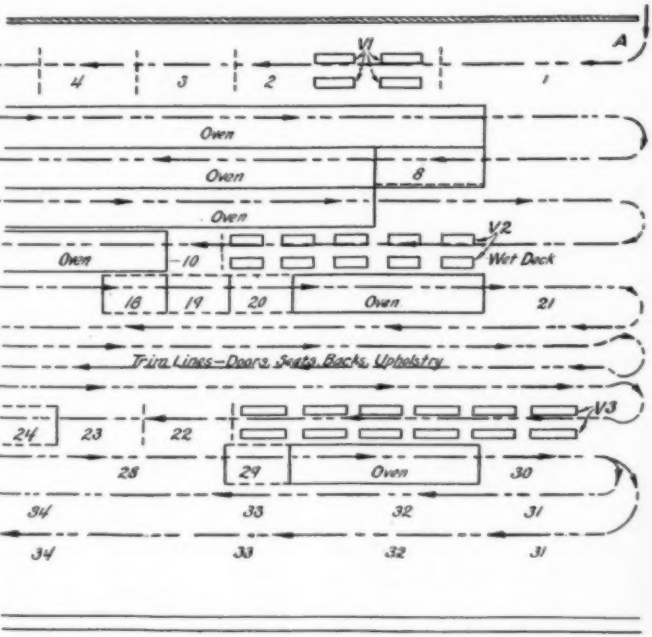


AUTOMOBILE BODIES

However, it is not my intention, at this time, to go into the various kinds, classes, and methods of applying different finishes, but rather to describe briefly the methods and equipment of a representative body manufacturer, producing automobile bodies with a finish comprising the three necessary objectives just mentioned. The Graham-Paige body plant at Evansville, Ind., is housed in a large modern, one-story brick building well arranged for the production of automobile bodies, and lighted throughout with a mercury lighting system.

A feature of the plant is that the railroad siding is included in the building, making it possible to load finished bodies in cars in the same building and under the

The illustration extending across bottom of both pages represents the finishing department floor plan including layout of equipment, production lines (in color) and work stations, distributed according to the sequence of operations from entrance A to the loading dock adjoining the railroad siding—all under one roof.



same roof in which they are completed. It might be mentioned in connection with this that the locomotive never enters the building.

All of the equipment is modern and is designed and installed to produce high class workmanship economically. A salient feature of this installation is the central pressure tank system whereby all finishing materials are contained in pressure tanks in an enclosed brick room adjoining the stock and supply room. The tank room contains twelve 60-gal. pressure tanks, with a 15-gal. reserve tank for each 60-gal. tank. This reserve tank is switched into emergency service, or used during the time the large tank is being refilled. An operating air pressure of 20-lbs. is carried on these tanks.

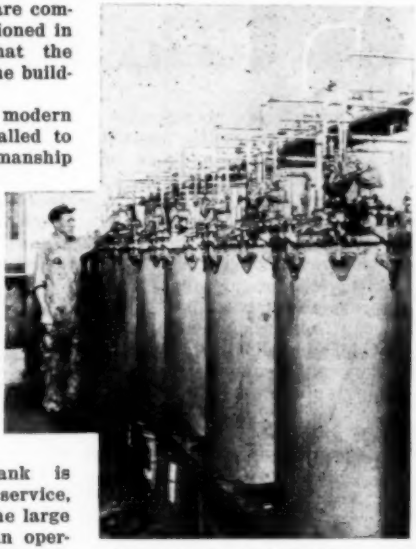


Fig. 2—The supply of finishing materials for immediate use at spray booths throughout the plant is stored in twelve 60-gallon pressure tanks in a room of fireproof construction, adjoining the stock and supply room. For each 60-gallon tank there is a 15-gallon auxiliary tank which can be switched into service while the large tank is being refilled. Pipe lines lead from the tanks to the spray booths. Operating pressure, 20-lbs. per sq. in.

Eight pipe lines lead from the tanks to the various spray booths for colored lacquer; the other four are for primer, surfacer, clean lacquer and thinner respectively. Nine colors are applied, with four color lines for lower body application and four for the upper. The thinner line is used in the mist spray. By this system six men are using guns connected to one pressure tank. This central tank system is highly desirable for economical production, especially when the spray booths are widely scattered over the finishing line and when there is a quantity of booths and colors being applied.

Each body goes through seven cleaning and drying operations before the application of oil primer. The first operation after the body enters the finish line is that of hand cleaning around all door and window openings, mouldings and any corners or close places where grease and dust accumulate. This first cleaning is done with a cheap grade of lacquer thinner, as the ordinary chemical cleaner wash will not cut the heavy grease from these close places.

The next operation is the chemical cleaner wash, wherein the entire metal surface is brushed with chemical cleaner to remove grease and corrosion. While the body is wet, the surfaces around all window and door openings, mouldings and other close places

Announcing the new

Curtis 75th Anniversary Compressor

Keeps out excess oil

Two distinct precautions against oil getting over into the supply lines

EVERY unnecessary drop of oil used in lubricating a compressor increases the chance of oil getting over into the discharge and supply lines, clogging the filter and ruining the job. The Patented Curtis "Centro-Ring" lubricating system delivers exact amount of oil to bearings, pistons and cylinder walls without one drop of excess. Also, the Curtis unloader does not permit valves to operate when machine is unloaded thus preventing oil pumping. The new 75th Anniversary Curtis Compressor is equipped with Timken roller bearings, increasing efficiency. Send for Anniversary catalog No. C-75 together with full details.

CURTIS

Founded 1854, this company is in its 75th year, indicating integrity, sound policy and strength.

Curtis Pneumatic Mchy. Co;
1977 Kienlen Ave., St. Louis,
5518D Hudson Term., N.Y.
Please send information
about .....
Name .....
Address .....

St. Louis

are rubbed with steel wool to insure perfect cleanliness. This is followed with a cold-water wash to free the surfaces of all chemical cleaner; then followed by a scalding hot-water wash, the hot water causing rapid evaporation and quick drying, which is further aided by a compressed air operation to blow the job dry. The body now enters an oven 80-ft. long (open at both ends) and for ten minutes it is subjected to a temperature of 175-deg. F. This completely dries the body surface, including all close places. On leaving the oven the body is sanded thoroughly with No. 2/0 garnet cloth and then washed by hand with denatured alcohol. This completes the cleaning and preparation of the metal surface for the oil primer, which is applied in a spray booth located at the end of the first conveyor line.

On leaving this first booth the body turns and enters an oven where the primer is baked for 1½ hours at 220-deg.F. After baking, any hair checks, rough places and spots showing file marks are glazed with lead putty, which is about the consistency of thick paint and applied with a 4-in. flexible knife. This brings us to the end of the second conveyor line.

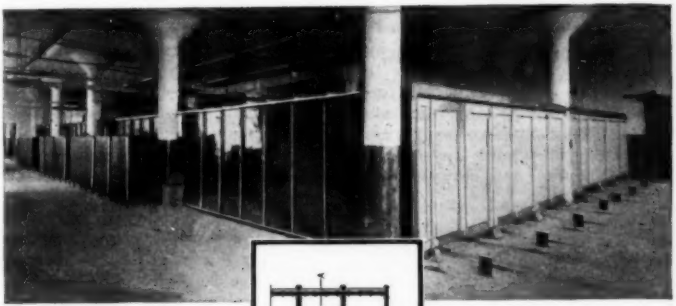
The body enters a spray booth where the first coat of oil surfacer is sprayed on; then the body immediately enters an oven where the first oil surfacer is baked for 1½ hours at 220-deg.F. Adjoining the outlet end of this oven is a spray booth where the second coat of oil surfacer is applied, this operation bringing us to the end of the third conveyor line; the body returns through an oven, baking the second oil surfacer for 1½ hours at 220-deg.F. The outlet end of this oven completes the fourth conveyor line.

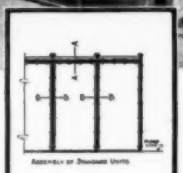
The next operation is wet sanding of the surface using No. 240 sandpaper and warm water applied with sponges. Convenient water vats are mounted along both sides of this line to facilitate the work of two men operating on each side of each body. A drain in the concrete floor is for water disposal.

Fig. 3—The line where bodies are washed with chemical cleaner, applied with long handled brushes, to remove grease and corrosion.

Fig. 4—(Below) The completely cleaned body entering an oven 80-ft. long where it is subjected to a temperature of 175-deg. F. It traverses the oven in ten minutes, during which time the body surface completely dries.

When Production Demands Rearrangement of Equipment





WHEN business expansion necessitates rearrangement of equipment to facilitate new production systems, the advantages embodied in Mahon Drying Ovens are keenly realized. The standard unit construction, with all insulation completely enclosed in metal, permits 100% salvage....these ovens may be dismantled and re-erected in a new location, in any size or shape to meet individual requirements, without damage to the insulating material. This feature is an important item to be considered in the selection of Drying equipment, particularly in plants where frequent changes in production lines are necessary. ¶ Mahon Industrial Drying Ovens are fireproof and waterproof....they are easily cleaned and require no maintenance whatever. Consult Mahon engineers before you select your next Drying Oven... let them show you the advantages of standard unit construction.

THE R. C. MAHON COMPANY

Detroit, Michigan

Manufacturers of Industrial Drying Ovens, Spray Booths and Exhaust Stacks, Blow Pipe and Dust Collecting Systems.

MAHON

INDUSTRIAL DRYING OVENS

BUILT FROM STANDARD INSULATED UNITS

This may be identified in Fig. 1 as the wet deck. The body is then cleaned and dried by means of compressed air, after which it enters an 80-ft. oven where it is further dried for ten minutes at 175-deg.F.

Immediately following the oven drying the job is inspected and any unsanded places are touched up. The entire body is wiped thoroughly to free it of any remaining dust. The body enters the next spray booth, where any rubbed through spots are sprayed with lacquer primer.

Now the body then enters a series of three spray booths, two men operating in each booth, spraying three double coats of colored lacquer on the lower body only. This is accomplished by spraying first horizontally and then vertically. The body immediately enters a drying oven where it remains ten minutes at 125-deg.F.

Here we are at the end of the fifth conveyor line. As the body leaves this oven the inside seat frames are coated with oil paint by hand.

Then come the masking operations, wherein masking paper is attached to the lower body by the application of gummed paper tape on straight flat surfaces and mouldings, and gummed cloth tape on curved surfaces or corners, where paper tape would curl on the edges. As a part of the masking operation, follows the application of metal templates fitted into door and window

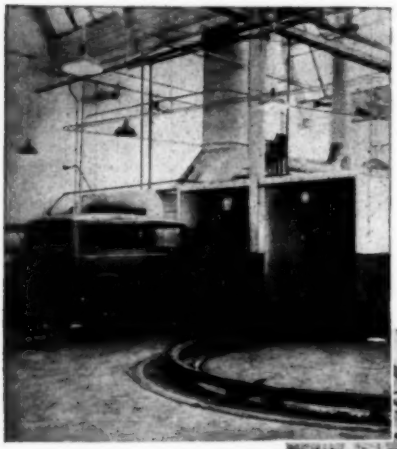


Fig. 5—(Above) The entrance to ovens 80-ft. in length. At the extreme left in background, there is a spray booth (where primer is applied) located at the end of the first conveyor line. On leaving this booth the bodies turn and enter an oven where the primer is baked for 1½-hrs. at 220-deg. F.

Fig. 6—(Right) The line at right is where bodies are wet sanded, using sponges to apply warm water while sanding with No. 240 sandpaper. Convenient water vats are mounted along both sides of this line to facilitate the work of two men operating on each side of each body.

Open Your Doors Now to Efficiency, Economy and Speed!

Haskins R B 6 Equipment

For polishing, rubbing or grinding—on flat surfaces or curved—in places easy to get at or ordinarily inaccessible—HASKINS Flexible Shaft Equipment will do the work more efficiently, more economically and in less time.

What does this mean to you? Just this. By reducing the time necessary to do a given job *labor costs go down.* By increasing output *profits go up.* Finally, by offering work of outstanding merit at a more attractive figure *business that has been going elsewhere comes to you!*

Thus HASKINS equipment represents a profit opportunity that many foresighted manufacturers are availing themselves of. Not only can they meet present competition successfully—they have also safeguarded their future.

HASKINS Equipments are used for Polishing Rubbing Sanding Grinding Brushing Etc.

You will, of course, wish to inform yourself fully about HASKINS Equipment. Write for descriptive literature.

Haskins SRA5 Equipment

R.G. HASKINS COMPANY

Portable Flexible Shaft Machinery

4647 W. Fulton St. Chicago

Branch Offices in Principal Cities

openings and held in place by means of eccentric pressure holders. This is done to protect the reveals from the next spraying operation.

The body then enters a series of three spray booths, where the upper body is given three double coats of colored lacquer in the same manner that the lower body was coated. Next the body enters an oven where it remains ten minutes at 125-deg.F. to dry the lacquered surface of the upper body.

Leaving this oven, templates and paper masking are removed, and the body is inspected for low places or dents in the metal surface (due to handling), which up to this point were invisible. These low places are straightened by hand, using rubber and wood mallets and small body tools. This completes the sixth conveyor line.

The body now starts in on the trim lines where all inside trimming and upholstering is done. This work requires four conveyor lines, the details of which I will omit and continue on finishing on the eleventh conveyor line where the last lacquer coat is water sanded by hand, using No. 280 and 320 sandpaper to remove any orange peel in the lacquered surface. This operation is similar to the one handled on the wet deck located on the fifth conveyor line, except for the grade of sandpaper used.

The job is then blown dry by air, after which another inspection follows and any small defects are filled with pyroxylin putty. After drying about five minutes, these spots are sanded and cleaned and the body enters a spot spray booth, where the spots are coated with lacquer the same color as the remainder of the body. This operation is immediately followed by a mist spray wherein a mist coat of lacquer thinner is sprayed over the entire body, bonding the whole surface, blending any hair scratches and giving to the whole a bright gloss.

The body enters an oven where it is dried for ten minutes at 175-deg. F.

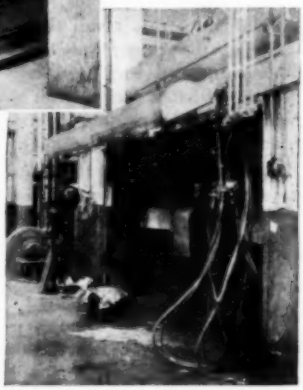


Fig. 7—(Upper left) Interior of spray booth through which the conveyor line passes.

Fig. 8—(Lower right) Looking into the side of one of the spray booths in the series of three where the upper body is given three double coats of colored lacquer. Notice at right, the four color supply lines with valves and spray guns attached—and at the left one of the motor-driven exhaust fans.

Sadwith INDUSTRIAL OVEN PANEL

"Built Like A Tower"

PATENT APPLIED FOR

The patented Sadwith post and beam panel design makes possible this remarkable oven that inaugurates an entirely new standard of economy and efficiency in oven construction, maintenance and operation.

It is the first and only oven that can be built up to any reasonable height by the simple addition of Sadwith panels—and without the use of additional structural steel. It furthermore provides an oven that can be quickly taken down or reassembled without any danger of damaging the panels.

Leading industrial executives have wholeheartedly pronounced the Sadwith panel a distinct engineering achievement that will effect savings in time, labor and money, far in excess of the cost of replacements of existing equipment where oven equipment expansion is even remotely anticipated. For new ovens, its obvious advantages cannot be questioned.

Write for Complete Particulars and Engineering Service.

CORPORATION~

HIGH TEMPERATURE HEATERS

DIP TANKS

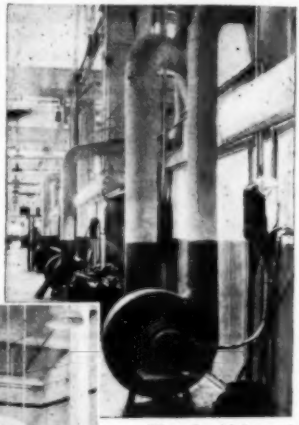
ENAMELING OUTFITS

DETROIT, MICH..

Cleveland, Portland, Ore.

after which the surface is hand rubbed with polishing paste of rottenstone and paraffin oil. It is inspected again and any defects are sanded down; then through a spot spray booth to cover defective spots, thence through an oven where spots are dried for ten minutes at 75-deg. F. At the outlet end of this oven the resprayed spots are rubbed and polished, completing the twelfth conveyor line.

The next operation is brushing lacquer on all mouldings, where mouldings require a different color than the body, followed by another touch-up station where all bare places on sharp edges, (for example, door edges) are covered, using lacquer for this purpose and a very small brush. The next operation is that of hand striping all mouldings that are curved, raised or depressed—where the machine striper will not work—and this is followed with the machine stripe operation.



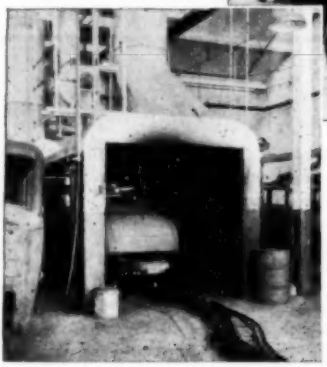


Fig. 9—(Above) Fans operating exhaust connected to the series of three booths wherein lower body is sprayed with lacquer. Fig. 10—(Left) Body entering one of the surfacer booths. Note exhaust fan and system mounted on top of booth. If the fan were placed on the floor at side of booth, it would interfere with conveyor line shown at left in picture.

Through the use of the stripe machine, eight men are striping about 250 bodies daily.

The body then enters the final inspection, repair and touch-up station, after which it is ready to be loaded into one of the railroad cars on the siding. Referring to Fig. 1, it will be seen that conveyor lines *13* and *14* are identical in their operations. This is made necessary because of the obvious slowing up of the line due to the nature of these final operations.

I have endeavored to emphasize and illustrate in the foregoing that this company has found that the secret of a satisfactory finish depends largely upon the careful application of enough high-quality materials on a correctly-cleaned surface, and the use of extreme vigilance all along the line. Through the employment of modern equipment and clockwork precision of operations the element of economy is accomplished.

Glidden Chicago Office Moves

The Glidden Company announces that the new address of its Chicago office is 1856 N. LeClaire Ave. as effective of May 1st.

"Cleaning—an important element"

—from "Industrial Finishing"

"CLEANING is an important element of the work of producing perfectly finished enamel wear," says an article in a recent issue of this magazine. And the selection of proper cleaning materials is just as important. That is why so many manufacturers depend upon Oakite materials and methods to clean metal surfaces before and after pickling. They have found that Oakite cleaning leaves the metal free from every trace of dirt and film; aids the pickling acid and insures a better finish.

Write for full details on Oakite cleaning materials and methods for your work. No obligation.

Manufactured only by

OAKITE PRODUCTS, INC., 32 F THAMES ST., NEW YORK, N. Y.

OAKITE

Industrial Cleaning Materials and Methods

JONFLEX has the "edge"

on all other tapes

The free sample will show you

Not only does Jonflex Industrial Tape—newest product of the Johnson & Johnson laboratories—cut cleaner, sweeter lines on masking jobs, but it has the edge on other tapes in many other ways.

No time lost when it goes on—Jonflex sticks quick without warming or processing. No easing around corners. No ironing out wrinkles. No buckling. It's workable and flexible.

No time lost when you lacquer—Jonflex hugs close to the job—sticks like old paint and won't slip.

No time lost getting it off—Jonflex quits a job clean. Leaves no adhesive behind, but *does* leave a razor edge line.

Lose no time trying it—Your name and company address is worth a one-inch wide, full 36-yard free roll of Jonflex. Send the coupon today.

JOHNSON & JOHNSON, New Brunswick, N. J.

Please let me try that free 36-yard roll of one-inch Jonflex Industrial Tape. I. F. — 6-29

*Name*_____

*Company*_____

*Street No.*_____

*City*_____ *State*_____

Kindly mention INDUSTRIAL FINISHING when writing advertisers

Metal Cleaning
Baked Finishing
Hand Graining

METAL BED FINISHING

Reviewing the cleaning and finishing operations on typical metal beds—smoothing with emery cloth, application of combination primer-ground coat, conveyor handling, oven baking, surface smoothing, hand graining, varnish spraying and final baking to produce semi-gloss finish

By E. Perry

A WESTERN manufacturer of square-tube steel beds is putting out a very presentable finish in three-coat work. The plant is not a large one, consequently production does not necessarily follow a rigid schedule; ample time is allowed for doing each phase of the work thoroughly. This does not mean that production lags or that the output is small, because neither is the case; the plant is well-organized, beautifully clean, orderly and systematic, and production is commensurate to its size with due regard for first-class workmanship.

Spraying Ground Coat

In the first place, the steel is seamless drawn, smooth and non-porous like bicycle tubing. After the fabricating operations are completed, the metal is carefully smoothed with fine emery cloth to eliminate any abrasions that might otherwise show up in the priming coat. After wiping off all dust and grit with a cloth, the frames are taken to the finishing room and suspended from an overhead conveyor which is the means of charging and discharging the oven.

Although suspended, the frames are off the floor only about a foot and in good position for spraying on the mahogany ground coat, which is a combination primer and ground color. This material has fairly good body, but not to the extent that sagging occurs or that it does not properly bake throughout in the heavier coated places.

Baking; Sanding

An electric oven with thermostatic control is used. The usual bake is one hour at 280-deg. F., but if the coat seems to require a little more hardness, the baking is extended somewhat. After this baked coat is cooled and hardened sufficiently for sanding without liability of tearing out any nibs or dirt that may have settled in the wet paint, the surface is sanded down smoothly to prepare it for graining. This sanding is not difficult or slow because the prime coat is made of finely-ground materials; it levels perfectly and bakes out almost flat, so the most it requires in surfacing is to remove the nibs with very fine finishing paper. The surface is wiped off with a tack-rag that is almost dry, just prior to graining.

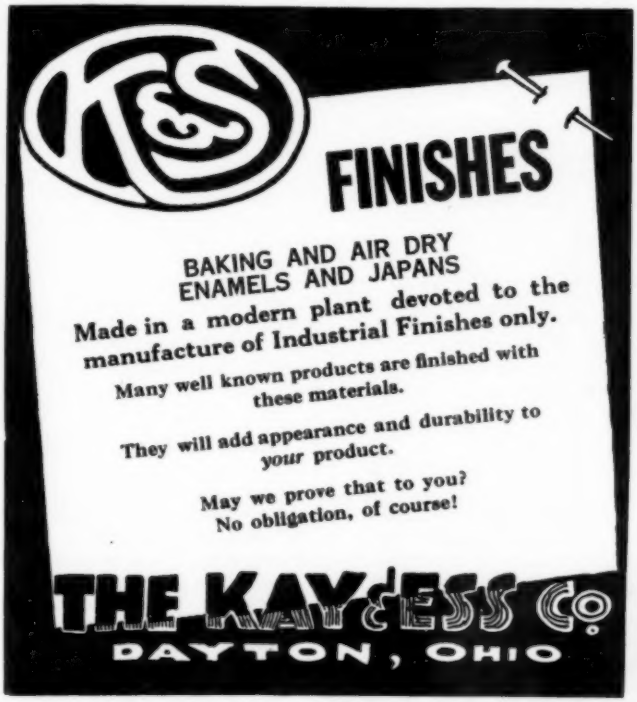
Graining; Finish Varnish

The graining color (mahogany in most cases) is in distemper and contains a little dextrine size, the water containing a small

amount of alcohol to cause quicker setting and to produce sharper grain outlines. Bedsteads, lacking wide expanse of surface, do not lend themselves much to machine graining by imprint from pattern and roller, although this is done to some extent in the larger shops.

For machine graining it is customary to use the regular graining colors in paste form and reduce them with turpentine to the desired consistency; but distemper graining obviates another baking. However, in this particular plant, the graining color is applied and blended by hand.

The final operation after the graining has become dry is to spray on a coat of semi-gloss baking varnish and bake for two hours at 225-deg.F. The final finish has the nice velvety dullness of a hand-rubbed job. A special varnish is used for this purpose; it is perfectly clear like a gloss varnish, consequently it possesses more depth without any trace of cloudiness, as is so often the case with the usual dulling varnish which is either pigmented or contains a flattening agent in solution. This varnish contains no flattening ingredients, and it is so constructed that the baking


FINISHES
BAKING AND AIR DRY
ENAMELS AND JAPANS
Made in a modern plant devoted to the manufacture of Industrial Finishes only.
Many well known products are finished with these materials.
They will add appearance and durability to your product.
May we prove that to you?
No obligation, of course!
THE KAY & ESS CO.
DAYTON, OHIO

ATLANTIC CHEMICAL CO.
Lacquer
A-LAC-D
PRODUCTS
IRVINGTON, NEW JERSEY

PRIMERS

Oil and Pyroxylin Base

#300 Gray Metal Primer
#309 White Metal Primer
#311 Red Oxide Metal Primer

Dry to recoat in one hour

#301 Gray Wood Primer
#310 White Wood Primer

Dry to recoat in one hour

These primers combine the good qualities of the old oil base and the pyroxylin primers giving—
Maximum Elasticity
Adhesion
Durability
QUICK Drying

All must be thinned at least 100 per cent for spraying. If you are using lacquer for finishing—by all means get the details. The coupon brings full information—promptly

ATLANTIC
CHEMICAL COMPANY
Irvington, N. J.

Send us the details of your wood and metal primers, Nos: .....
.....
.....

causes the desired degree of semi-gloss finish. The baking produces the right hardness and this permits immediate wrapping with paper.

Make the First Coat Right

"Never mind the first coat; it doesn't have to be fussy!" I have heard these instructions repeatedly in various finishing rooms. All too often it is believed that the finishing coats will hide first coat imperfections. It is true they may occasionally hide a multitude of sins, so to speak, but a solid, carefully applied first coat helps to make a far better finish.

Recently, on some metal baked finishes, the first coat dried with a pitted orange-peel effect. After covering this with the later coats, the ruined finish was called to the attention of the foreman finisher who replied, "I thought the finishing coats would take care of that."

The fallacy of this statement was evident by the coarse rough finish produced in this case. Since then, this man in particular has learned his lesson and now the men in his finishing department give more attention to the first coat—and noticeably higher-grade finishes have resulted.—Joseph Cowan.

Radiator Cover Finishes

Gone are the days of the wide, unsightly sectional radiator! Enter the new radiator shield finished in a wealth of color to match any room or finished to match the woodwork in oak, walnut or mahogany—in either case adding new charm to the home and removing for all time a long-neglected eyesore. Hidden from view behind their colored

Industrial FESCO *Finishes*

for Metal and Wood

OLIVE GREEN ENAMELS AND GROUND COATS
RUBBING AND FLAT DRYING VARNISHES
CLEAR AND COLORED LACQUERS
UNDERCOATERS FOR LACQUERS

Manufactured in one of the most modern plants in the Industry.
If you have a finishing problem let us help you solve it.
One of our practical men will call at your invitation.

The Ferbert-Schorndorfer Co.
Cleveland, Ohio

steel jackets, the radiators still function in radiating heat and good cheer.

Not only do these inclosures finished in harmonizing colors function as a shield; they also serve as a useful piece of furniture. Made of the finest furniture steel and finished to match the color of the room or grained in walnut, oak or mahogany, or finished in old ivory, this cover transforms the tall hall radiator into a console.

Window seats made colorful with cushions and comfortable with cushion pads, are created by these covers in color over low radiators. In like manner serving tables, and resting places for books, flowers, pottery and lamps are provided, forming a pleasing decorative scheme when finished in colors to harmonize with the room furnishings. The colored inclosures also protect the wall and ceiling finish, as well as draperies and curtains; finished in attractive colors, they play an important part in this decorative age where color in everything is the vogue.—Arthur J. Owen.

Care of Spray Gun

The wear in spray guns varies as to the make of gun. Some guns are so constructed as to compensate for the wear on certain parts by means of an adjustment. Others are made so the same part can be purchased at low cost and replaced easily. But the life of all spray guns can be prolonged by carefully noting the points of wear and friction, and oiling these every day before using the gun.

I prefer springs made of bronze, and nozzles case-hardened, well plated and finished; also

Quality merchandise—

Low Prices—
Quick Service—

Considering the high quality of our painters' supplies you will find that our prices are low. Let us prove to you that you CAN buy quality supplies at a saving. Send the coupon below for our new catalog No. 50.

Another thing, merchandise is shipped to you within twenty-four hours of receipt of your order.

"Willson" Dustite Respirator

It is necessary at all dusty work and spraying. It prevents illness resulting from breathing irritating and poisonous dust and spray.

Prices, each..... $ 2.00
Prices per dozen..... 18.00
Extra Dustite Filter Papers, per 100.... 1.00

Prices are net F. O. B. Chicago

Geo. E. Watson Co.

"The Paint People"

164 W. Lake St. Chicago, Ill.

Please send me your new catalog on painters' supplies.

Name.....

Firm.....

Position.....

Street Address.....

City and State.....

IF 6-Gray

all valves case-hardened and plated with chromium. Operators should be made to feel that the spray gun is a fine tool and that it should be treated as such—not to be used for driving nails, or dropped or thrown around indifferently.— M. V. Leach.

Fixtures to Suit Room Colors

Color schemes have, in the past few years, been very popular in the kitchen and bathroom, and now their use is extending to the bedrooms of our homes of the present day. Color schemes for these rooms are receiving much attention. In bedrooms, as in all other rooms, the wall is the first consideration in building up a color scheme.

Brackets and fixtures can now be chosen to please in size, shape and color. The latest in bathroom fixtures come in colors that harmonize with their surroundings. Colored tiles, colored borders and plumbing fixtures—all are available. In a recently finished bathroom, peach-colored tiles with black borders were used for wainscoting, the lighting fixtures were finished in peach with black decorations.—A. J. Owen.

Increased demand for bridge lamps has created an annual market for 5,000 tons of lamp shade wire.

Manages Great Lakes Territory for Quincy

Mr. D. C. Lambert, formerly Asst. Sales Manager for The Quincy Compressor Co., Quincy, Ill., is now located in Chicago, as Manager of the Great Lakes Sales Division for Quincy compressors and accessories. Mr. H. P. Marshall has succeeded him at Quincy, Ill. The Chicago office address of this company is 218 Engineering Bldg., 205 West Wacker Drive.

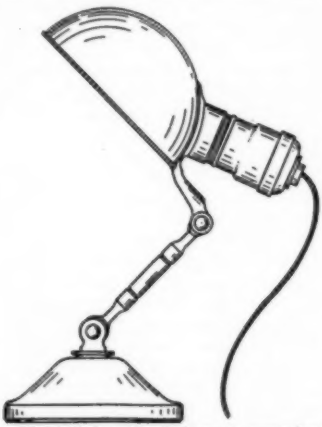
QUESTIONS AND ANSWERS

This service department is conducted to meet the readers' need for prompt information on specific problems, and to give others an opportunity to review the questions and to offer comments, suggestions or answers

Finishing Adjustable Lamps

We are sending you an adjustable metal lamp that we manufacture. This lamp is finished with one coat of colored lacquer on the outside and, the one coat of aluminum bronze on the inside of the reflector and base. We will appreciate any suggestions you might have as to the best method of handling this article so as to obtain the lowest possible cost, considering both the quantity of material used and the labor involved.—G. B. Co.

Editor's Note: This lamp (illustrated in the accompanying drawing) is a pressed metal job, excepting the C. I. connecting rod, and it is so proportioned and designed that it can be folded, the bottom of the base nesting perfectly into the cup of the reflector.



Finished in colored lacquer, excepting inside the cupped reflector and base. Diameter of reflector 4-in.; base 3¼-in.

For the first operation, I suggest finishing the inside of the base and reflector with aluminum bronze lacquer. To hold the lamps in position for this spray finishing operation, I would make trays or racks each large enough to hold 15 or 20 lamps placed side by side in a row, with the socket end of each lamp resting on one of the pegs in the row, and the edge of the base resting directly on the tray, as shown in Fig. 1.

The trays could be made of wood, each being about ¾-in. thick, 8-in. wide and as long as necessary to accommodate a reasonable number of lamps—for example, 15 or 20, as just mentioned. With a number of lamps set up in this position on the tray, the spray operator can spray the reflectors and then the bases. For continuous, high-speed, quantity production the bottom of the board tray can be provided with rollers or placed on a roller top table or conveyor, thereby making it possible to pass a continuous run of lamps before the spray gun. The spray man can spray them as they move past his position, or while they pause a moment in front of him.

This sort of arrangement will

Economical Marketing

To make sales more easily than your competitor, a big portion of your effort must be accomplished through the finish on the merchandise.

BARRETT

Stains - Fillers
Pure Shellac Varnishes
Shellac Compounds
Shellac Substitutes

Gloss Lacquers Flat Lacquers
Lacquer Primers Lacquer Enamels
Varnishes
Shellac Gums and Alcohol

Meet the most rigid requirements and at a price you will regard as reasonable.

Accurate Control of All Operations Insures Highest Quality

Barrett Varnish Company

Originators of Dependable Finishes

1532 S. 50th Court, Cicero, Ill.

probably necessitate cutting openings in both sides of the spray booth to admit and exit these moving loaded trays, but at that it is simple and requires no expensive preparations. Helpers must be stationed in suitable positions to load and unload the racks.

Another way, a little more expensive in preparation but more suitable for quantity production,

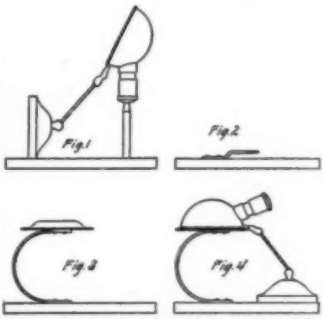


Fig. 1—Lamp mounted on tray, ready for spraying cupped interiors of base and reflector.

Fig. 2—A flat metal clip arranged to hold under side of base when lamp is in position for spraying the outside, as shown in Fig. 4.

Fig. 3—The spring-supported mask over which the reflector is pressed (as in Fig. 4) to shield the interior of reflector when colored lacquer is sprayed over the outside of entire lamp.

involves the use of a merry-go-round type of table top to support the lamps being sprayed. This merry-go-round top should be mounted on ball-bearing rollers or casters that travel on or in a track supported by a sub-top or base of the same shape. The apparatus should be built as large as the spray booth will conveniently accommodate. The revolving top will have perpendicular pegs, as did the trays, to support the lamps in suitable position for spraying.

The spray man stands with his spray tanks inside the merry-go-round and sprays the lamps as the hollow circular table revolves around him. A helper standing outside the booth, away from the spray, puts on the unfinished lamps and removes the finished ones. The merry-go-round can be turned by hand or by power. If it is turned by power, some provision should be made to give different speeds to suit different conditions which may arise in connection with other work.

This arrangement provides for almost continuous spraying, and it affords opportunities for rapid, economical production. Really, it is an excellent method for spray finishing all small articles. With each revolution of the merry-go-round a certain number of articles are (or should be) finished, and this supplies a basis for estimating the output per hour and per day, thereby enabling the management to check up production costs more accurately.

The exposed part of the table should be covered with paper to protect it from the spray; when one job is finished the paper may be removed and the same table is then clean and ready for practically any other specialty. It is well to nail a sheet-metal skirt to the inside edge of the hollow-circle top, letting it come down well past the top of the supporting base to shield the rollers and their runway from overspray and the resulting accumulations of finishing material.

Now for the finishing coat. After the aluminum bronze is dry enough to permit the lamps to be handled, I would place the lamps on another rack large enough to hold at least five or more.

Each tray may be made of a short board about 10-in. wide. To

Pulmosan

Chemical Cartridge

Respirator

99.7% Efficient by Actual *Test!

Filters—positively keeps out all leads or benzols from spray gun.
Body—aluminum, shell-shaped.
Cushion—Non-inflated, non-irritating, pure gum; fits any face
Exhaust Valve—positive flutter.

For Lacquer, Pyroxylin Paint, Enamel and Lead Spraying

$6.00 EACH, COMPLETE

**Details on Request*

PULMOSAN
SAFETY EQUIPMENT CORP.
174 Johnson St. Brooklyn, N. Y.

Kindly send details of your respirator for ..... spray gun work.

NAME .....
FIRM .....
ADDRESS .....

What Every Finishing Foreman Requires

Jamestown's No. 2798 Lacquer Primer

Pale in Color
Lays smooth
Does not lift
Sands easily
Dries quickly
Full body
Seals perfectly
Transparent

Jamestown Wood Finishing Co. products are guaranteed. If they will not do for you what we claim for them your money will be refunded.

Stains — Fillers — Shellacs
Varnishes — Lacquers — Enamels

Jamestown Wood Finishing Company

MAIN OFFICE AND FACTORY
Jamestown - - New York

BRANCHES
Bristol, Conn. Lenoir, N. C.
Milwaukee, Wis. New York City

hold each lamp steady and securely in position on the tray (so it will not be moved by the pressure of spraying), I would use bent strips of sheet metal, fastening one at each station to be occupied by a lamp base. Each strip of metal is shaped as indicated in Fig. 2, and it is firmly screwed to the top of the wood tray. A spring-actuated U-bar inside the lamp base (part of the lamp construction) can be sprung out and inserted under the raised part of this spring clip as the lamp base is pushed forward to cover it. So much for temporarily anchoring the lamp bases to the tray.

Now the aluminum bronzed interior of the reflector must be masked to shield it from the overspray of colored lacquer while the exterior parts are being sprayed. For this purpose I suggest a device similar to what is shown in Fig. 3. The masking shield consists of a sheet metal disc slightly larger in diameter than the rim of the reflector, and a turned disc of wood which will fit up into the opening of the reflector. This masking shield is mounted on the end of a bent strip of spring steel or something of the kind, and mounted on the tray in such a position that the reflector of the temporarily anchored lamp will fit down over it, as shown in Fig. 4.

The trays with these fittings can be loaded with lamps and placed on the regular spray booth turntable, or run through the booth on rollers as previously suggested, or placed on the merry-go-round for the spray operator. Two helpers will probably be needed—one to fasten the lamps to the tray fittings, and one to supply the spray operator with

trays of unfinished lamps and relieve him of trays of finished lamps.

The trays provided to hold the lamps in position for spraying the outside color coat will remain loaded until the finish is dry enough to permit the lamps to be removed.—M. V. Leach.

Dip Finishing Iron Pipe

We are interested in developing a satisfactory method for finishing iron pipe. This pipe ranges from ⅜ to 5-in. in diameter and from 15 to 30-ft. in length. The pipes are to be finished on the outside with a heat resisting black paint, and we intend to try the spray system of finishing. However, we believe a satisfactory system of dipping could be used which would prove more economical, and would like information on this.—P. G. Co.

I believe a combination dipping and rolling device could be easily developed which would satisfactorily apply the black paint much more economically than the spraying method. No doubt the mechanical staff of your organization can develop one of the following ideas, or some similar one, to a point where satisfactory results could be obtained.

My idea would be to build a long shallow tank with a cross section something similar to that illustrated in Fig. 1. The depth and slope of the V-trough sides in this tank should be designed to satisfactorily accommodate the various diameters of pipe you expect to finish. The bottom of the V-trough is slotted and connects with the reserve chamber (tank) which contains a supply of finishing material and some such wick-

The Blue Knight's Column

". . . we had reason to believe that you could help us with a lacquer finish . . ."

By the way, it just occurs to me that when you read these excerpts from customers' letters that appear quite regularly in my ads, you might get the wrong notion. No, emphatically! Letters like these are, well, not an every day matter . . . but let's say I get one a week. That's about right. I use them in these ads because it's a better idea to have your customers say nice things about you than it is to try saying them yourself.

Anyway, to get back to the point . . . sure this customer had reason to believe that I could help him. I showed him how to crack a hard nut before. He knows that my key men are all graduate chemists or chemical engineers. He knows that in them is a solution for his problem.

Today my Lab is buried under a slue of problems. Some are so tough they have us wooxy. I can't take on any more for the immediate present, but just as soon as some of the smoke clears away, I'll again issue invitations to send on the stickers . . .

In the meantime, if you would like to see a series of research bulletins on some of the materials we already have produced for manufacturers, I'll be glad to send them to you. Write to the Technical Sales Department, please, and let us know if you are interested in any particular problem. Maybe my men have already solved it!

The Blue Knight

ROXALIN FLEXIBLE LACQUER COMPANY
105-9 SEVENTH AVENUE
LONG ISLAND CITY

"Ty-Loid"
Lacquer Enamels

and Undercoatings

We manufacture a complete line of Primers and Surfacers in oil and pyroxylin, and a complete line of colored Lacquer Enamels.

Our No. 91 Brown Oxide Primer is an Oil Primer composed of best oil and iron oxides, which are the best preservatives for metal. No. 91 Brown Oxide Primer will force dry in a few hours or will air dry over night. It is neutral to our No. X-C. 100 P-X. Oxide Surfacer or Lacquer Enamels, and does not bleed when colors are applied over it.

Our No. X-C. 100 P-X. Oxide Surfacer is heavy bodied, requiring a fifty-fifty reduction and is ground fine in pebble mills to give a smooth surface when sprayed. It requires little sanding to surface ready to lacquer over. There is no swelling of undercoat when lacquer is applied; therefore, no shrinkage in file and surfacing marks after the finish is completed.

A trial order of these goods will convince the most critical and make you more friendly with our line.

Manufactured by

The Western Reserve Varnish Co.

1251 Marquette St. Cleveland, O.

ing as tow, burlap or other loosely woven material, the wicking filling the bottom of the trough and being well saturated with paint all the time. The tank should be long enough to receive the longest length of pipe to be coated. The method of procedure is to lay the pipe in the trough and rotate it until it is properly coated with the paint.

Another plan would be to mount two felt-covered rollers so they would revolve in a shallow tank of finishing material, as illus-

Fig. 1—A dipping tank with V-trough top and a quantity of saturated wicking W, into which the pipe A is laid and rotated to cover it with paint.

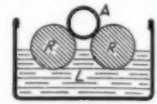


Fig. 2—A dipping tank in which two felt-covered rolls RR, are mounted to support the pipe A and spread paint onto its surface as the rolls are revolved.

trated in Fig. 2. As the rollers revolve in the tank, their surfaces would become covered with paint which in turn would be transferred to the pipe placed between them and rolled with them. Both rollers should be driven in the same direction. The rollers should be of sufficient length to accommodate the longest pipe to be painted. In operation, the pipe would be rolled between the upper faces of the rollers, and in one revolution of the pipe its outside surface would be completely spread with the paint. The size of the rollers should be such as to take care of the different diameters of pipe.—P. J. Marvington.

I believe the dipping method to be the lowest in cost, although it will probably require more paint. If the ends are plugged with wood

plugs, the insides will not be coated. I suggest a long U-shaped (in cross section) trough a little longer than the longest length of pipe. A workman can be stationed at each end of the trough and the pipes can be handled with tongs.

Back of the tank I suggest a rack made of angle iron to support the freshly dipped pipes. The sharp edges of the angle iron will not touch enough of the finished surface to mar the finish or remove much paint as the pipes are rolled into place. This rack should be kept clean and there should be a drip pan under it.

If short lengths are to be dipped, I would have one tank made about 12-in. square and 12-in. longer than the longest length of pipe to be dipped. I would fill this tank with water up to within 18-in. of the top, and then pour the paint or japan on top, as it will float. In dipping, the pipe passes through the paint into the water and back through the paint, but it is not affected much if any by the water. This method requires less paint, but it is not satisfactory for long pieces. With water underneath the paint, I have found that any foreign matter sinks to the bottom, thereby leaving the paint clean.—Wm. S. Lyhne.

Wood Handle Dip Racks

Do you know any special types of dipping racks in use for holding handles while being dipped in enamel and baked? These handles are with and without holes, and vary from 3 in. to 12 in. in length. Nail racks are troublesome owing to the fact that some handles fall off during the finishing process.

On one type of handle—electric iron handles—we have difficulty

HVW

Following is a list of some of our products adapted to spraying, dipping or brushing.

Wood Lacquers
Metal Lacquers
Primers
Colored Enamels
Enamel Primers
Automobile Enamels
Pyroxylin Thinners
Aero-Lac
Q-D-Lac
Bronzing Lacquers
Celluloid Cements
Concentrated Dyes
Lamp Colorings
Novelty Finishes
Solvents and Solutions

Our Service Department is at Your Disposal

Cort.
Phones: 0894
0895

HENRY V. WALKER CO.
17 John St. New York

A Suggestion

Surely any first-class finisher is open to suggestions that pertain to his particular business.

You are constantly being bothered with the clouds of gritty dust, that are caused by the wearing away of your cement floors, falling on articles just finished.

You, no doubt, have been troubled with this condition all through your plant; if so, our suggestion to you is to apply a coat or two of FRENCH'S CEMENT FLOOR PAINT, and your troubles are at an end.

FRENCH'S CEMENT FLOOR PAINT is made in ten attractive shades, is easy to apply, water-proof and after being applied flows to an enamel-like finish and gives your floor that easy-to-keep-clean high lustre.

FRENCH'S CEMENT FLOOR PAINT not only stops dusting of the floors, but prevents dampness appearing on the same, and last but not least, stops disintegration which of course figures to a great extent in your building up-keep program.

FRENCH'S CEMENT FLOOR PAINT is a scientifically prepared paint developed and manufactured exclusively by Samuel H. French & Company, Philadelphia, Pa.

Hy-Speed

ELECTRIC MIXERS

Clamp to *any* tank and mix *all* liquids. A wide variety of sizes and types up to 50,000 gallons capacity.

PATENTED
The Features that insure the supremacy of "Hy-Speed" Mixers are fully covered by U. S. Patents

MIX QUICKER

LAST LONGER

COST LESS

Write for Catalogue

ALSOP ENGINEERING CO.

47 West 63rd St., New York

in getting rid of end drips which mar the finished product. How can this be overcome with the least labor?—W. A. C. Co.

I suggest using a dip rack such as that illustrated in the accompanying drawing. Racks of this type can be made of wood or

metal, or of a combination of the two. The end pieces serve as convenient handles for the operator when he dips a rack full of handles and, after the handles have been dipped, the end pieces serve as excellent supports to hold the row of handles firmly in upright position while the finish drains and dries.

A helper can easily load the rack by pressing the "blind end" of each handle upon one of the screw points and giving it a turn or two to thread it onto the screw point. This will securely attach each handle to the rack and, after the finish has dried, the handles can be easily removed.

When constructing such a rack, care must be taken to use screws long enough to extend well beyond the level of the end pieces, so that when a rack full of handles is dipped the end pieces will clear the top surface of the liquid—that is not touch it.

I believe this idea is much better than sticking the handles onto nails, or inserting screw eyes in the blind ends of the handles. One of these loaded racks of handles can be easily handled, and it can be turned so that the handles either hang down or stand up-

right while the dipped finish drains. After dipping, leave the handles hang in position for draining until they stop dripping. Then remove the last drip with a brush to avoid a half-formed drop at the lowest point.

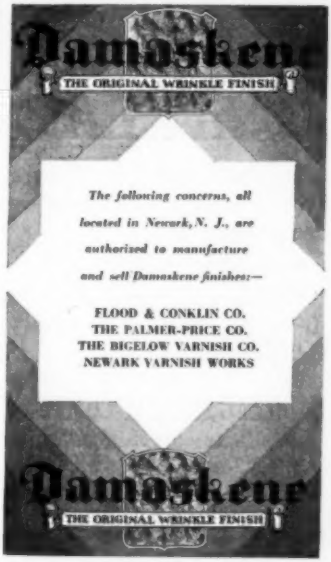
For forced drying, these racked handles may be placed in an oven and baked at low temperature for an hour or so, or some other means of accelerated drying may be employed.

If the handles are to receive another coat, dip them again, but reverse their position as regards draining so the enamel will flow in the opposite direction as it drains. This will give a more even coating.—Fred Mannhardt.

Referring to the above proposition I discarded nail racks after a few trials and substituted wood screws in the place of nails. A slight twist given to the handle locks it so it will remain rigid. This feature enables the dipping operator to reverse the rack and dip only the handles, leaving the rack clean at all times.

Handles without holes present a more difficult problem and, though production of handles of this class is relatively small, here is how we handle them: Battery clips of the pincher type are riveted to the rack frame, and each handle is clamped at the end. The very small marks made by the clips are hidden later by the ferrule.

An important problem in handle dipping is the formation of end drips, but this can be overcome in several ways. One method is to wipe or touch the bottom of each handle with a rag that has been soaked in solvent and wrung out; if this is done immediately after the dripping stops, a clean end will result. A small varnish


Damoskene
THE ORIGINAL WRINKLE FINISH
The following concerns, all located in Newark, N. J., are authorized to manufacture and sell Damoskene finishes:—
FLOOD & CONKLIN CO.
THE PALMER-PRICE CO.
THE BIGELOW VARNISH CO.
NEWARK VARNISH WORKS
Damoskene
THE ORIGINAL WRINKLE FINISH

EASY NOW TO REPAIR DAMAGED FINISHES

Permanent repairs are easily and quickly made with Campbell's Stick Shellac. No use to lower prices because of damage—or to incur big expense of refinishing.

CAMPBELL'S STICK SHELLAC

Campbell's Stick Shellac easily restores scarred and scratched finishes to perfect condition. It is melted into the hole, dent or scratch and then rubbed down and polished. It is truly an ideal way to economically repair damaged finishes.

UNIVERSALLY USED

A color card of Campbell's Stick Shellac will be sent free to anyone upon request. Shows actual samples of the Shellac and the range of 54 different colors. Write for one today.

The M. L. CAMPBELL CO.
1007 W. 8th St. Kansas City, Mo.

Before using

CADILLAC SHELLAC

Some said, "We cut our own, for then we *know* what we are getting."

After using, they say, "We *know* what we are getting when we buy CADILLAC."

CADILLAC SHELLAC COMPANY
Incorporated

Ferndale (Detroit) Michigan

No. 76

A light weight aluminum respirator with a soft molded rubber cushion to fit snugly against the face. There is real comfort and protection in the No. 76. Price $1.75 each.

CHICAGO EYE SHIELD CO.
2300 Warren Ave. Chicago, Ill.

brush can be used instead of the cloth.

Still another plan, to be employed just at the end of dripping period, is to place the rack over a shallow pan filled to a depth of 1 in. with solvent; the ends of the handles are held at the height of about 1 or 2 in. above the solvent, the fumes of which will soften the ends and prolong the dripping time until ends are all clear.

Sometimes the trouble is in the enamel; the finished surfaces appear clean, with no end drips when ready for the oven, but after baking, end drips show up; heat softens the enamel and starts it dripping again. This enamel is unsuited for dipping; and enamel that is longer in oils should be used.

If large production in this line is to be carried over a long period of time, by all means get in touch with some concern that makes and installs automatic dipping machines and tanks. Several of the advertisers in INDUSTRIAL FINISHING can supply this equipment. Their experts will make a study of your particular problem and install machinery that will do away with all end drips, as the handles come out of the tank at the same speed as the flow of the enamel.—H. H. Smallwood.

Developments are not only in new finishes; improved methods of application of some of the older materials have made them more beautiful, and easier to apply.

Cadillac Shellac District Sales Manager

Mr. Howard F. Goodman has been appointed District Sales Manager for the Cadillac Shellac Co. Inc., Detroit., with offices at 940 Seneca St., Buffalo, N. Y. Mr. Goodman will be in charge of sales for this company in New York and Pennsylvania.

Lacquering on Porcelain Enameled Stoves

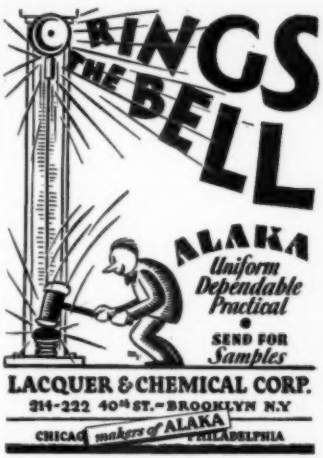
I would like to have information on lacquering over vitreous enameled surfaces—specifically, porcelain finished stoves.—F.W.

In lacquering on porcelain (vitreous enameled) stoves, I believe it will be necessary first to scratch or roughen the surface with some sort of abrasive such as fine emery cloth or by sandblasting. I prefer the latter if the equipment is available. Acid etching may be okey, but I prefer sandblasting to acid. I happen to know of a red primer, also a gray surfacer, that sticks to glass remarkably well and either of these materials provide an excellent undercoat for lacquer.

This gray surfacer stays on glass without a primer and is very hard to remove when dry. Lacquer alone will adhere well if the glass or porcelain surface is perfectly clean, but I prefer putting it on a surfacer.

However, I want to emphasize that lacquer is not the best material for stoves. The heat may burn it unless the lacquer finish is oven dried before the stove is used, or unless plenty of time is allowed for it to air dry so that most of the combustible elements will be evaporated from the lacquer.

This finish is dangerous on ovens or near flames. It is okey for the legs or for an over-all finish for exhibition purposes only. Lacquer colors may change, fade or darken quickly from the effects of heat, or the finish may spot from the heat or splashed hot grease. Also, heat may cause it to become brittle and chip or chalk. I do not advise its use for parts of stoves subjected to heat.



Roxalin's New Chemical Engineer

Mr. Milford H. Corbin, chemical engineer, honor graduate of Lehigh University, is now a member of the technical staff of The Roxalin Flexible Lacquer Co., Inc., of Long Island City, New York.

Corbin, as research chemist with L. F. Grammes & Sons, metal nameplate manufacturers of Allentown, Pa., established their chemical laboratory and conducted some interesting investigations on the subject of the finishing, plating and etching of metals.

His last connection, with the Litho Etching Corporation, carried him through their consolidation with the Electro Chemical Engraving Co. as director of research.

Mr. Corbin just recently joined the technical service of Roxalin, where undoubtedly his previous experiences will stand him in very good stead.

After taking these things into consideration, if lacquer is still to be used, it is important to keep in mind that some lacquers are much less combustible when dry than others.

The following list of operations are recommended for this finish:

1—Sandblast or rub with fine emery cloth.
2—Dip in hot chemical solution or alkali cleaners, or wipe up with an effective metal cleaner.
3—Dip in clean hot water.
4—Place in hot oven to evaporate the water and dry the surface.
5—Let cool to 75-deg. F.
6—Spray on surfacer or primer.
7—Scuff sand and dust off with compressed air.
8—Spray lacquer.

The primer or surfacer coat can be omitted if cost is prohibitive. A suitable lacquer used on an electric stove may prove very satisfactory, but in my opinion, it is not the most suitable material for use on any kind of stoves. —M. V. Leach.

For ordinary utility purposes, the vitreous enamel or porcelain enamel surface is far superior to a lacquered surface, and I doubt the wisdom of applying lacquer over such a surface. We lacquer porcelain cups, bowls, and spoons on the outside only, and for the last two or three years we have been asked to lacquer highly-polished gold and silver trays and liquor flasks.

The advantage of a lacquered surface is its low heat conductivity. It is pleasant and very nice to touch for it will never become uncomfortably (excessively) cold under ordinary conditions—contrary to metal or glass, which conduct heat readily.

We do not use any acid or abrasive on glass, enamel, porcelain or highly-polished metal. But the lacquer coat is baked without exception, and the thinnest pos-

sible coating is given—the thinner the better. We use three coats for black, but other colors require from two to six, according to the kind of work. So far, we have heard no complaints and no goods have come back.

I have thought of using fine emery cloth for highly-polished metal ground, and to etch the vitreous or porcelain surface with hydrogen fluoride, but this involves certain risks on the part of the worker. So in the absence of any complaints, we are not interested in trying other methods. I am sure there is no way of "getting by" with a one-coat job on such fine smooth surfaces.

Also, I should like to learn if there is any way of applying lacquer so it will stick on the vitreous or enameled porcelain or highly-polished gold at all times without baking.

For the purpose stated, I should think that either of two certain lacquers* would be suitable; they must be baked. These lacquers produce a finish that is heat, acid and alkali-resisting to a high degree. Later on, I shall have occasion to report on this item.—F. S. Araki.

Such a proposition is a new one to me and of course I cannot quite see the need for it, but no doubt your clients have a justifiable reason. I would avoid the use of any acids in trying to roughen the porcelain to give it a holding surface, as it has been my experience that when porcelain is treated with acid, the acid continues to work for a long time to come, no matter how thoroughly it may have been cleaned off. As a result it chips or peels off within a few months Of course,

*Names on request.

Finishing Research Advisory Service

The First Service of Its Kind

Where do you turn for sound advice on your Finishing Problems? Finishing Research Advisory Service through its corps of Finishing Engineers can save you hundreds of dollars on all problems relating to processes, colors, paints, varnishes, lacquers, equipment, dipping, etc.

This service costs but $100.00 per year—a small fraction of what it saves you.

A HELPFUL BOOKLET, "Finishing Research Advisory Service" tells exactly what you get and shows how it profits you. Write for your copy - TO DELAY IS EXPENSIVE.

FINISHING RESEARCH
LABORATORIES, INC., *Chicago*
Established 1923
1162 West 22nd Street
Consulting Engineers Publishers
Testing Engineers

Crescent Bronze Powder Co.

Direct Importers and Manufacturers

Bronze Powder
Metallics, Gold and
Aluminum Leaf

Bronzing Liquid, Gold
and Aluminum Paint
Manufacturers

116-122 W. Illinois St.
CHICAGO

IT'S FOOL PROOF!

The New Improved

"JIFFY STRIPER"

Makes Striping a Pleasure

It's a tool anyone can use—you, yourself, can turn out a PERFECT STRIPING JOB with just a little practice. The Jiffy Striper is used and endorsed by leading Artists and Painters of Flint, Mich.

Can be used with Duco or Lacquer—makes every sort of stripe from finest to a stripe ½-inch wide.

Costs only $10.00, Complete

Ask your supply dealer to furnish; if not, send your order and check today to:

THE E. M. REEVES CO.

228 West 12th St. Flint, Mich.

CORUCO

F. O. S.

is the

MASKING TAPE

you have been looking for.

Send for free sample and prices

The Consumers Rubber Co.

1302-04-06 Ontario St.

Cleveland

sandpaper or emery cloth would be too slow. The only other solution I can see is perhaps sandblasting. But any of these roughing jobs will spoil the high polish or luster that is on the porcelain.

Occasionally we have to apply lacquers on metals and have found it unsatisfactory on smooth surfaces where we use colors. But if we can first apply a coat of clear lacquer, we find that this sticks much better than the colored lacquer. It is then no trouble to put on a second coat over the clear lacquer, applying whatever color one may desire. Whether or not this will work on enamel one cannot say, but a very little experimenting will reveal the facts.—Wm. S. Lyhne.

In regard to the method of putting lacquer on a vitreous enameled surface, I have done this a few times and found that the best method is to sandblast the surface. If the sandblast is not available, a heavy sanding with very coarse cloth will probably do, but I would advise the sandblast if possible. Whether a two coat or a one-coat job is required depends entirely on the color. If the color is the same, one coat should be sufficient.—E. W. McMullen.

Airplane Dopes and Their Application

(Continued from page 28)

The fabric, before doping, was fireproofed with an ammonium sulphate solution. This navy specification has probably been changed, but both methods of finishing resulted in a taunt, durable cover.

Commercial Finishes

As previously noted, because the cost per gallon of clear acetate

The Finish	First 2 Coats	Third Coat	Fourth Coat	Fifth Coat	Sixth Coat	Seventh Coat	Eighth Coat	Ninth Coat	Tenth Coat	Sand Lightly Between Coats No.	Remarks
Pigmented Acetate Dope	Clear Acetate Brush	Clear Acetate Brush	Clear Acetate Brush	Pigmented Nitrate Spray	Pigmented Nitrate Spray	*Mist Coat Spray				None	Spec. Finish for Army
Enamel with Acetate Dope	*	Clear Nitrate Brush	Clear Nitrate Brush	*Clear Nitrate Brush	Navy Enamel Spray	Navy Enamel Spray				None	Spec. Finish for Navy
Pigmented Dope All Nitrate	Clear Nitrate Brush	*	*	* *	Pigmented Nitrate Spray	Pigmented Nitrate Spray	Mist Coat Spray			5 & 6 6 & 7	High Grade Commercial
Clear Dope All Nitrate	*	*	*	*	Clear Nitrate Brush	Spar Varnish Spray	Spar Varnish Spray			6 & 7 7 & 8	Almost Obsolete Commercial
*	*	*	*	*	Flexible Pigmented Lacquer Spray	Flexible Pigmented Lacquer Spray	Flexible Clear Lacquer Spray			3 & 4 6 & 7	Commercial
*	*	*	*	Pigmented Lacquer Spray	Pigmented Lacquer Spray	*Mist Coat Spray				4 & 5 6 & 7	*
*	*	*	Alum.-Semi-Pigmented Dope-Brush	Alum.-Semi-Pigmented Dope-Spray	Aluminum Dope Spray	Pigmented Lacquer Spray	Pigmented Lacquer Spray	Pig. Lacq. Spray	*Mist Coat Spray	3 & 4 4 & 5 6 & 7 7 & 8	High Luster Commercial
Semi-Pigmented Nitrate Dope	Semi-Pigment Brush	Semi-Pigment Brush	Semi-Pigmented Spray	Semi-Pigmented Spray	60-80 Gloss Spray					5 & 6	Training Planes & Commercial
*	*	*	*	*	Flexible Lacquer Spray	Flexible Lacquer Spray				4 & 5 5 & 6 6 & 7	High Luster Commercial

Table of fabric finishes and their usual applications.
*This coat is usually applied only when necessary.

dope is considerably higher than clear nitrate dope and because the pigmented dope finished without gloss, airplane manufacturers turned to dope and paint manufacturers for gloss finishes.* Gloss finishes for pigmented dopes, fabric lacquers, flexible lacquers, gloss dopes and other high luster finishes began to flood the market. Most of these were put out by reliable manufacturers and all have their good and bad qualities. All need perfecting, and the reason I believe that eventually a chemical or synthetic paint or lacquer will solve the problem of coating and glossing airplane fabric, is because the best gloss solution I have used was a chemical flexible lacquer. The fault of this flexible lacquer was lack of high gloss. It gave a semi-gloss.

High-gloss lacquers usually are very brittle. Also, they tend to loosen the tension of doped fabric. But they are used to a considerable extent and present the best appearance when new. However, methods of finishing airplane fabrics are changing constantly, and as newer and better finishes are bound to appear soon, I shall give the doping scheme of a few of the finishes most commonly used on airplanes today. I am putting these in tabulated form for ready reference, see accompanying table.

The aluminum nitrate dope referred to in the table is a semi-pigmented mixture of 1-lb. aluminum powder to 12 gallons of clear nitrate dope. Its use by some finishers is recommended for the purpose of: 1—a ground for poor hiding colors, 2—a filler and sanding surfacer, and 3—an opaque protective coating for the fabric. Its use, in moderation, aids the finisher in many ways, but like a great many other products of aid to the finisher, a little goes a long way.

The Sanding of Fabric

Until recently the sanding of doped fabric surfaces was considered poor form. Army and Navy specifications specifically prohib-

*Apart from clear spar varnish, which deteriorated in a short time.

ited the use of any abrasive on dope because of the danger of cutting the fabric fibres and injuring the dope film. A six-coat dope job was supposed to present a smooth even surface without the use of sandpaper.

With the introduction of cheaper (and consequently lower grade) dopes, sanding became absolutely necessary. Even with the best of dope, there are times when the judicious use of sandpaper gives the final finish a much better appearance. But the sanding of fabric surfaces must never be done by careless or inexperienced hands, because the only parts of a doped surface that should be sanded are those portions not touching or bearing upon the frame and the tape edges.

Just as the grain in wood raises and must be sanded smooth, so the dope raises the "nap" in fabric causing a roughness that must be overcome either by applying extra coats or by sanding. Where smoothness cannot be obtained by doping, I believe sanding in the manner given below does not seriously injure the dope film, provided the sanding is done with care.

The first sanding is done after the third coat of dope has been applied; a dry No. 2/0 flint paper is used. Rub lightly and *never sand over corners*, or over those places where any wood, metal or cord bears against the cover, as the sandpaper will cut through the dope film and cut the fabric threads. It is important to *sand very carefully*.

On a six-coat job, sand again after the fifth coat. Wetordry sandpaper can be used, No. 220. If water sanded, be sure to allow the fabric to dry thoroughly before doping, as dampness on the fabric will blush the dope. Where more than six coats are applied, a third sanding can be given before the final coat is applied, but this sanding should be very light.

To Get Gloss

Gloss can be obtained on pigmented dope by applying a mist coat of retarder or anti-blush (high boiler) thinners, or by using a good flexible clear lacquer. In the semi-pigmented dopes a gloss solution is usually offered by the manufacturer.

High-luster lacquers, when made for fabric, usually lose some of their luster. A mixture of straight reducer and anti-blush reducer, applied as a mist coat, will increase their gloss. Some manufacturers are offering glossy pigmented dope.

Whatever material is selected or used, it will always present some difficulty to the finisher, because airplane dope is so easily effected by changes in climate, atmosphere, temperature and age that regardless of the care the manufacturer exercises in the making of his product, and the care exercised by the finisher in applying it, there will be times when the same product applied in the same manner and proving successful over and over again, will react and disconcert the finisher time and again.

However, aging or seasoning is a vital factor, so if at least 12 hours are allowed between acetate and nitrate dope; and 12 hours between any dope and lacquer, and time is allowed for the retarder or highboiler to dry out under proper air conditions, many dope room troubles vanish. The use of good material, proper drying time between coats, and patience will bring the covered airplanes to the point where it is ready for lettering, striping and insignia.